SOIL SURVEY

Somerset County Maryland

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
MARYLAND AGRICULTURAL EXPERIMENT STATION

Issued July 1966

Major fieldwork for this soil survey was done in the period 1946-59. Soil names and descriptions were approved in 1964. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1964. This survey of Somerset County was made as part of the technical assistance furnished by the Soil Conservation Service to the Somerset Soil Conservation District.

HOW TO USE THIS SOIL SURVEY REPORT

THIS SOIL SURVEY of Somerset County contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, or other structures; and in appraising the value of tracts of land for agriculture, industry, or recreation.

Locating Soils

All the soils of Somerset County are shown on the detailed map at the back of this report. This map consists of many sheets that are made from aerial photographs. Each sheet is numbered to correspond with numbers shown on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information in the report. This guide lists all of the soils of the county in alphabetic order by map symbol. It shows the page where each kind of soil is described, and also the page for the capability unit, drainage group, irrigation group, and woodland group in which the soil has been placed.

Individual colored maps showing the relative suitability or limitations of soils for many specific purposes can be developed by using the soil map and information in the text. Interpretations not included in the text can be developed by grouping the soils according to their suitability or limitations for a particular use. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils in the soil descriptions and in the discussions of the interpretative groupings.

Foresters and others can refer to the subsection "Woodland Management" where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others concerned with wildlife will find information about soils and wildlife in the subsection "Wildlife."

Community planners and others concerned with suburban development can read about the soil properties that affect the choice of homesites, industrial sites, schools, and parks in the section "Nonfarm Uses of Soils."

Engineers and builders will find under "Engineering Uses of the Soils" tables that give engineering descriptions of the soils in the county and that name soil features that affect engineering practices and structures.

Scientists and others can read about how the soils were formed and how they are classified in the section "Formation and Classification of Soils."

Students, teachers, and others will find information about soils and their management in various parts of the text.

Newcomers in Somerset County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "General Nature of the Area," which gives additional information about the county.

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Contents

NOTICE TO LIBRARIANS

Series year and series number are no longer shown on soil surveys. See explanation on the next page.

Issued July, 1966

EXPLANATION

Series Year and Series Number

Series year and number were dropped from all soil surveys sent to the printer after December 31, 1965. Many surveys, however, were then at such advanced stage of printing that it was not feasible to remove series year and number. Consequently, the last issues bearing series year and number will be as follows:

- Series 1957, No. 23, Las Vegas-Eldorado Area, Nev.
- Series 1958, No. 34, Grand Traverse County, Mich.
- Series 1959, No. 42, Judith Basin Area, Mont.
- Series 1960, No. 31, Elbert County, Colo. (Eastern part)
- Series 1961, No. 42, Camden County, N.J.
- Series 1962, No. 13, Chicot County, Ark.
- Series 1963, No. 1, Tippah County, Miss.

Series numbers will be consecutive in each series year, up to and including the numbers shown in the foregoing list. The soil survey for Tippah County, Miss., will be the last to have a series year and series number.

SOIL SURVEY OF SOMERSET COUNTY, MARYLAND

REPORT BY EARLE D. MATTHEWS AND RICHARD L. HALL, SOIL CONSERVATION SERVICE

SURVEY BY F. Z. HUTTON, SR., H. H. BOSTON, F. A. FILIOS, ALLEN GREINER, RICHARD L. HALL, AND RONALD JONES, SOIL CONSERVATION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE

UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH MARYLAND AGRICULTURAL EXPERIMENT STATION

SOMERSET COUNTY is on the southwestern side of the peninsula that juts between the Atlantic Ocean and the Chesapeake Bay (fig. 1). It is the southernmost Maryland county in the area called the Eastern Shore. The county occupies 212,480 acres, or 332 square miles, including Smith, Deal, James, South Marsh, and other islands in the bay. Princess Anne, the county seat, is in the north-central part of the county. Crisfield, a port town and an important fishing center, is on the Little Annemessex River in the southwestern part of the county.

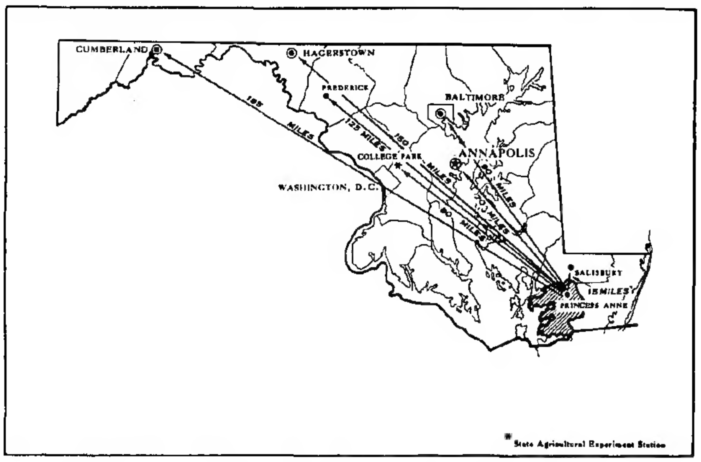

Figure 1.—Location of Somerset County in Maryland.

The climate of Somerset County is temperate and uniform. It is favorable for general farming and for specialized farming that includes growing truck crops and strawberries and raising poultry. Producing of timber is of some importance and could be expanded.

The shores of the Chesapeake Bay and the extensive marshes along the tidal streams are favorite haunts for migratory waterfowl, and the waters of the bay and the streams abound in fish. These fish and birds attract many sportsmen. Although urban areas have not developed in Somerset County, there has been a need for information about the properties of the soils that affect septic tanks, building sites, streets, parks, and other nonfarm facilities.

General Nature of the Area

This section describes the physiography, climate, and vegetation of Somerset County. It also mentions the organization of the county, summarizes the past trend of population, and discusses transportation, markets, and agriculture.

Physiography, Relief, and Drainage

Somerset County, in the Atlantic Coastal Plain, is low and nearly level to gently undulating. Almost all of the county is less than 40 feet above sea level. In the extreme northeastern part of the county, a small area is higher than 40 feet. The highest point, about 46 feet, is on the Worcester County line about 2 miles northwest of Friendship Church. Only about 10 percent of the county has elevations of more than 20 feet. Most of this area extends irregularly southward along the eastern boundary of the county, from a point about 2 miles west of Eden to a point just north of Puncheon Landing. A few small areas scattered on the terraces of the Wicomico River are also more than 20 feet high.

Salt marshes are common along the tidal rivers, on the islands in the Chesapeake Bay, and along the edges of Mongrel Neck, Fairmount Neck, and Crisfield Neck. Fresh-water swamps are also common, the largest extending along the Pocomoke River in the southeastern part of the county. Most of the rivers and creeks are tidal for several miles from their mouth, and the Pocomoke and Wicomico Rivers are tidal throughout their extent in Somerset County. The Manokin River is tidal as far as Princess Anne.

Somerset County is drained by streams, including their tributaries, that flow into Tangier Sound on the west and Pocomoke Sound on the south (*6*).[1] Most of the county is drained by the Wicomico, Manokin, and Big Annemessex Rivers, and the tributaries of these streams. A large acreage is drained southward by East Creek, Marumsco Creek, their tributaries, and a few smaller streams. The county is not intensively dissected by drainageways. Elevations are low, slopes are generally nearly level or gently

[1] Italic numbers in parentheses refer to Literature Cited, p. 89.

sloping, and some gullies that formed have been filled with sandy wash.

The soils in almost two-thirds of the county have impeded drainage. About 23 percent of the county consists of salt water marshes, and about 6 percent consists of swampy fresh water areas. In only about 10 percent of the county are the soils drained well enough naturally that, without artificial drainage, they can be farmed.

Organization and Population

The area consisting of Somerset, Wicomico, and Worcester Counties was organized as Somerset County in 1668, but later Wicomico and Worcester were formed into separate counties. Most of the settlers in this area were of English descent and came mainly from the Baltimore area. A few came directly from England. The economy first was based largely on maritime industries, but later farming and lumbering became important.

During the first decade of 1900 the population of the county increased from 25,923 to 26,455, but since 1910 the population has decreased. The county had 24,602 people in 1920, but by 1960 the number of people had decreased to 19,623. This decrease in population was caused mostly by migration to urban areas. All of the people in Somerset County were classed as rural in 1960, and 68.6 percent were classed as rural residents who do not farm.

Princess Anne, the county seat, had a population of 1,351 in 1960, and Crisfield had a population of 3,540. Among the other towns are Deal Island, Upper Fairmount, Marion, Westover, and Lawsonia. Except for the towns and the marshy and swampy areas, the population of the county is fairly evenly distributed.

Climate [2]

The climate of Somerset County is humid and semicontinental. Winters are mild, and the summers are rather hot.

Because the prevailing winds in this area are from the west, the Atlantic Ocean on the east does not have full effect. In cool seasons, however, northeasters move up the coast ahead of low pressure centers and bring raw, uncomfortable weather and, in winter, much of the precipitation. Also in winter, the Appalachian Mountains and the waters of the Chesapeake Bay have a moderating effect on the cold air from the northwest.

This low, gently undulating county is less than 20 feet above sea level in about 90 percent of its area and is as much as 40 feet high in only a few areas in the northeast. Hence, the climate of the county varies little throughout, and the data given for Princess Anne in table 1 should be representative of the county.

Coastal areas have about the same afternoon temperatures as Princess Anne but, generally, a degree or two lower maximum temperature. On the other hand, nights are considerably warmer near the bay. This warming effect of the bay is less in winter than in other seasons. It is greatest in October because the land cools much faster than the water during the lengthening nights. In winter the average minimum temperature is 4° warmer at coastal Crisfield than at centrally located Princess Anne. In October the average minimum temperature is 9° warmer at Crisfield than that at Princess Anne.

The last week of July is usually the hottest time of the year in Somerset County; the average maximum temper-

[2] By A. DELBERT PETERSON, State climatologist, U.S. Weather Bureau.

TABLE 1.—*Temperature and precipitation at*

Month	Temperature											
	Average daily maximum	Average daily minimum	Highest	Year of occurrence	Lowest	Year of occurrence	Average monthly maximum	Average monthly minimum	Average number of days with— Maximum of 95 degrees or higher	Maximum of 90 degrees or higher	Minimum of 32 degrees or lower	Minimum of 20 degrees or lower
	°F.	°F.	°F.		°F.		°F.	°F.	°F.	°F.	°F.	°F.
January	48	28	87	1952	−10	[1] 1957	67	9			21	8
February	49	28	74	[1] 1951	−5	1934	67	11			20	6
March	55	33	84	1939	7	1960	74	18			16	2
April	66	42	94	1960	20	1943	84	27		(2)	5	(2)
May	76	51	97	1941	26	1956	89	35	(2)	1	(2)	
June	84	60	100	1934	37	[1] 1954	94	45	1	7		
July	88	65	102	1940	41	1952	96	52	3	12		
August	86	64	100	1932	40	1952	94	50	1	9		
September	81	57	98	1932	31	[1] 1956	92	39	(2)	3	(2)	
October	70	45	98	1941	18	1952	84	28	(2)	(2)	3	(2)
November	60	36	85	1950	12	[1] 1952	76	19			13	1
December	49	28	73	[1] 1956	−5	1958	67	15			21	7
Annual	68	45	102	1940	−10	[1] 1957	97	5	5	32	99	24

[1] Also in earlier years. [2] Less than one-half day. [3] Less than one-half inch. [4] Trace.

ature is 89° F. The coldest time of the year is during the first week of February. The highest and lowest temperatures that can be expected at Princess Anne in each month of the year are shown in table 1. On the average, the highest temperature is 96° or 97° at Princess Anne, and the lowest average temperature is 5° at Princess Anne and 13° at Crisfield. A temperature as high as 100° was recorded only once at Crisfield, on July 22, 1930. On the same day at Princess Anne, the temperature was 104°, and on the two previous days it was 105°, the highest ever recorded in Somerset County. At the other extremes, both Princess Anne and Crisfield had recorded temperatures of −5° on February 9, 1942. This was the lowest temperature ever recorded at Crisfield. Princess Anne, however, had a temperature of −10° on February 15, 1898, on January 11, 1942, and on January 18, 1957.

Figure 2 shows the probability of the temperature dropping to 20°, 24°, 28°, 32°, or 36° after any date in spring. For example, suppose you want to know the last date in spring on which a temperature of 28° can be expected with a 20 percent probability (2 years in 10). Start with the probability of 20 percent and follow its horizontal line to the right until it intersects the line labeled 28° F. or lower. From that point drop a line vertically to the bottom margin, and you will see that the date is April 16. Figure 3 shows the probability of the temperature dropping to specified low temperatures before any date in fall, and it is used in the same way as is figure 2.

The average growing season is only 180 days at Princess Anne, but it is 232 days at Crisfield. The influence of the water decreases rapidly in the first mile inland, but further inland it decreases more slowly. The difference in temperature between coastal and inland

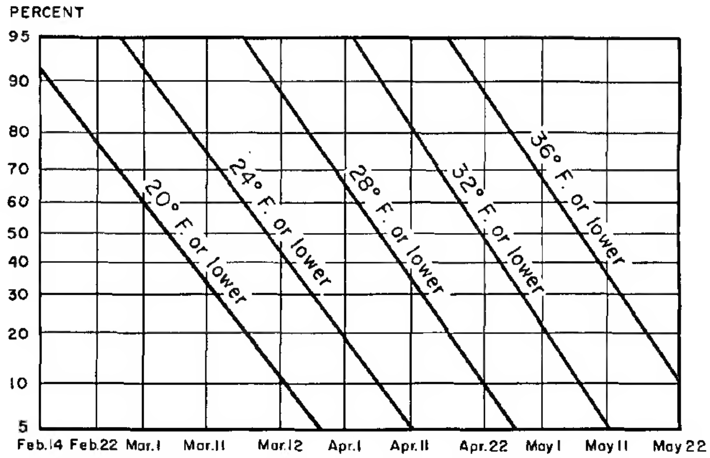

Figure 2.—**Probability, in percent, that temperature *will* be as low as 20°, 24°, 28°, 32°, or 36° after any given date in spring.**

areas is greater in spring than in fall. Also, Princess Anne has a greater range of temperature than Crisfield. Temperature can change greatly within a few days at Princess Anne because cold arctic air from the northwest meets tropical air from the south and southwest. For example, in April 1960 Princess Anne had a temperature of 28° in the morning of the 20th, but by the afternoon of the 23d, the temperature was 89°, a change of 61°. The greatest changes in temperature are most common in spring. Variations in summer are much less extreme because polar air that has not been modified seldom reaches the area.

In this county precipitation is fairly evenly distributed throughout the year, as shown by the precipitation data

Princess Anne, Md., 1931-44 and 1949-61

Precipitation														
							Average number of days with—		Snowfall					
Average monthly total	Wettest year	Year of occurrence	Driest year	Year of occurrence	Maximum during a 24-hour period	Year of occurrence	0.1 inch or more	0.5 inch or more	Average monthly total	Maximum during a month	Year of occurrence	Maximum during a 24-hour period	Year of occurrence	Average number of days with 1.0 inch or more
Inches	*Inches*		*Inches*		*Inches*				*Inches*	*Inches*		*Inches*		
3.5	9.00	1937	1.47	1951	2.40	1936	7	2	3	27	1940	16	1940	1
3.4	7.18	1961	1.34	1954	2.00	1934	7	2	3	18	1936	18	1936	1
4.4	7.29	1942	2.05	1933	2.60	1942	9	3	2	17	1960	10	1960	1
3.3	7.85	1937	1.20	1942	2.25	1937	7	3	([3])	1	1940	1	1940	--------
3.5	7.96	1934	.31	1936	2.29	1951	7	2	([3])	([4])	[1] 1944	([4])	[1] 1944	--------
3.6	7.74	1955	.62	1954	2.67	1932	6	2	--------	--------	--------	--------	--------	--------
5.1	12.36	1938	.71	1957	4.60	1938	7	3	--------	--------	--------	--------	--------	--------
5.4	11.36	1937	1.62	1932	6.19	1953	7	3	--------	--------	--------	--------	--------	--------
4.4	13.33	1935	.49	1941	6.86	1935	6	3	--------	--------	--------	--------	--------	--------
3.6	8.30	1956	1.57	1934	3.82	1956	6	2	--------	--------	--------	--------	--------	--------
3.1	5.98	1952	.52	1931	3.00	1960	6	2	([3])	4	1938	3	1938	([2])
3.1	6.02	1936	1.08	1939	1.90	1960	6	2	2	14	[1] 1958	8	1958	1
46.4	56.50	1938	33.73	1943	6.86	9/1935	81	29	10	35	1940	18	1936	4

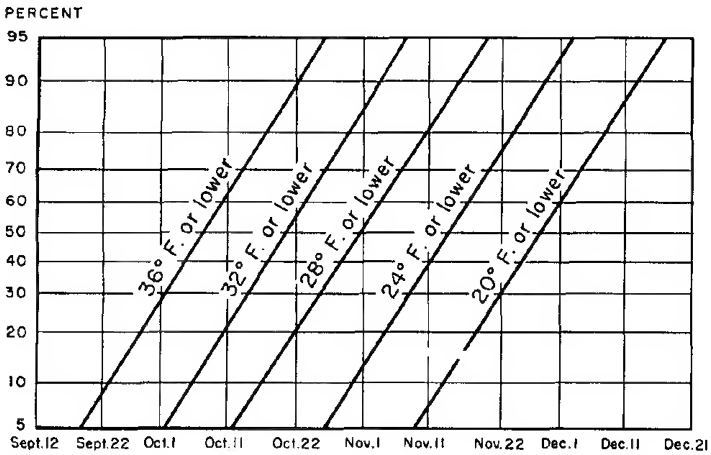

Figure 3.—**Probability, in percent, that temperature will be as low as 20°, 24°, 28°, 32°, or 36° before any given date in fall.**

in table 1. The column headed "Average monthly total," shows that only in July and August is average monthly rainfall as much as 5 inches. The additional rainfall in those months is partly in thunderstorms and partly in tropical storms that may bring twice the average monthly total in 1 or 2 days. For example, in September 1935, Princess Anne received 12.10 inches of rain in 52 hours when a hurricane passed nearby. To some extent, the additional rainfall compensates for the greater amount of evaporation during July and August and for the greater amount of water used.

Rainfall is more variable and less dependable in summer than in winter. In summer, rain comes in localized thunderstorms; in a local area 2 or 3 inches may fall within 2 or 3 hours, but a few miles away there may be only a sprinkle. General storms cover large areas in winter.

In Somerset County droughts are frequent in summer. Although rainfall is generally adequate for good yields of crops, the unequal distribution of the showers and the occasional dry periods make irrigation necessary for maximum yields. The driest year on record was 1930, when only about 24 inches of rain fell at Crisfield and about 25 inches fell at Princess Anne. In the period from July 25 to September 6, Princess Anne received only 0.76 inch, and Crisfield also received less than an inch.

The average annual snowfall is only about 10 inches in the county. In the winters of 1948-49 and 1955-56, only a trace of snow fell at Crisfield and only 1 or 2 inches fell at Princess Anne. In the winter of 1939-40, on the other hand, 34.5 inches were recorded at Princess Anne and 27 inches at Crisfield. More recently, in the winter of 1959-60, the snowfall was 22.5 inches at Princess Anne and 16.8 inches at Crisfield. At Princess Anne during the winter of 1898-99, there were 39 inches of snow; on February 13, 1899, 20 inches of snow lay on the ground.

In this county thunderstorms occur on an average of 30 to 35 days a year. They may occur in any month of the year but are most frequent in summer. Generally, only one or two occur in winter. Three-fourths of the storms are in June, July, and August. Hail accompanies these storms once or twice a year.

About once a year, generally in August or September, hurricanes pass close enough to the county to cause damage, but generally this damage is minor. Occasionally a severe hurricane moves up the coast, and damage from the heavy rains, high winds, and high tides is widespread.

The estimated average velocity of winds is 8 to 10 miles per hour. The velocity is higher in spring than in summer. In any month, however, winds may blow at a rate of 50 to 60 miles per hour. The strong winds in summer may accompany thunderstorms or hurricanes. Those in winter come in the general storms of that season.

The relative humidity in this county is generally highest in summer, when tropical air is prevalent, and is lowest in winter and spring. During a day the highest relative humidity generally occurs at about sunrise. At sunrise relative humidity is about 90 percent in summer and 70 to 75 percent in winter and spring. In the afternoon it is about 60 percent in summer and 50 to 55 percent in winter and spring.

Vegetation

Except for its marshes, Somerset County was almost entirely covered by hardwood trees. The trees were mostly water loving, or at least water tolerant, because most of the soils were wet. Oaks dominated in most areas, the species depending on the wetness of the area. Other important trees were silver maple, sweetgum, blackgum, holly, bay, dogwood, beech, and birch. In the very wet areas some black pine and pond pine grew; cypress was plentiful in the swamps. Loblolly pine and Virginia pine probably were also present, but these trees were not extensive and did not grow in pure stands until after many areas had been cleared of hardwoods. Loblolly pine became dominant in heavily cut areas and on abandoned cropland, particularly on soils that had impeded drainage. Virginia pine or scrub pine became dominant in areas of sandier and droughtier soils. The tidal marshes support coarse grasses, rushes, and some shrubs and small trees that tolerate salty water, or at least brackish water.

Transportation and Markets

In colonial days, all settlements in the area that is now Somerset County were on or near navigable water and transportation was mainly by water. Transportation by water, particularly to the many islands, is still important, but modern highways now cross the county, and there are many secondary hard-surfaced roads.

Since the opening of the Chesapeake Bay Bridge, Somerset County has been easily accessible by highway from the State capital at Annapolis and from other points west of the Chesapeake Bay. The Pennsylvania Railroad serves Crisfield, Marion, Princess Anne, and other communities. Salisbury, in adjacent Wicomico County, provides air passenger service.

Somerset County has access to agricultural markets by water, by highway, and by rail. Major markets are in Baltimore, Wilmington, Del., Philadelphia, Pa., and Norfolk, Va., but Washington, D.C., and other cities west of the Chesapeake Bay are also easily accessible.

Agriculture

Agriculture in Somerset County is favored by a temperate climate, well-distributed rainfall, a fairly long growing season, and responsive soils. Some of the soils

TABLE 2.—*Acreage of principal crops and number of fruit trees of all ages in 1960* [1]

Crop	Unit	Rank in State
	Acres	
Soybeans (harvested for beans)	13, 748	6
Corn (all purposes)	10, 652	17
Hay	2, 950	21
Irish potatoes	511	2
Strawberries	253	1
Vegetables for sale	5, 137	7
Snap beans	2, 549	1
Tomatoes	2, 179	1
Cucumbers	89	6
Lima beans	71	10
	Number	
Apple trees	1, 529	16
Peach trees	2, 965	12

[1] From Comparative Census of Maryland Agriculture by Counties (*4*).

are suitable for general farming and truck farming without artificial drainage, but most of them need artificial drainage. Although not extensive, the agriculture of the county is diversified and somewhat specialized. Somerset County leads the State in the production of strawberries, tomatoes, and snap beans, and it is third in the State in the production of poultry. The statistics in this subsection are from "Comparative Census of Maryland Agriculture by Counties" (*4*).

Crops and pasture

Table 2 lists the acreage of principal crops and the number of fruit trees in the county in 1960 and, compared with the other counties in the State, gives the rank, according to acreage harvested, that Somerset County held for each crop and kind of tree. A total of 34,864 acres was harvested in 1960 (*4*). Soybeans, harvested mostly for beans, occupied the largest acreage. In order of declining acreage, other crops were corn, vegetables grown for sale, and hay. In total acreage of harvested crops, Somerset ranked eighteenth among the 23 counties in the State.

The total acreage in pasture is not large. In 1960, only 7,443 acres was grazed in the county, and of that acreage, 3,675 acres was cropland used temporarily for pasture.

Poultry and livestock

Raising poultry is more important in Somerset County than all other livestock enterprises combined. In 1960, the county ranked third among the counties of the State in the number of broilers and other chickens sold. The broilers sold amounted to 14,866,000, and the other chickens amounted to 14,917,000. In addition, 569,000 dozen eggs were sold in the county.

Livestock raising is only of minor importance, and most of the products from dairies are used locally. In 1960 there were 4,810 cattle and calves on farms, and 1,182 of these were milk cows. Other livestock on farms included 586 sheep and lambs and 6,521 hogs and pigs.

Types and sizes of farms

In 1960, poultry farms were more common in the county than general farms, vegetable farms, livestock farms, or farms of any other type. Of the 663 farms, 423 were commercial, 160 part time, and 80 unclassified and miscellaneous. Only 50 farms were operated by tenants.

The average-sized farm in 1960 consisted of 129 acres. Only 29 farms were larger than 500 acres, but 111 farms were smaller than 10 acres. There were 169 farms between 10 and 49 acres in size, 128 farms between 50 and 99 acres, and 226 farms between 100 and 499 acres. The farms less than 10 acres in size have increased in number since 1950, but the farms in all other size ranges have decreased. Most of the smaller farms were poultry farms. The 663 farms in the county occupied a total of 85,528 acres in 1960.

Farm power and mechanical equipment

In this county mechanized equipment is much more important as a source of power than horses and mules. Only 144 horses and mules were reported on farms, and some of the horses were kept only for riding. Tractors were reported on 498 of the 633 farms in the county. These tractors were mostly of the wheeled type, and they were used for most farm operations. Trucks were reported on 462 farms, combines on 160 farms, cornpickers on 171 farms, and pickup hay balers on 68 farms. The farms having home freezers numbered 316.

How Soils Are Mapped and Classified

Soil scientists made this survey to learn what kinds of soils are in Somerset County, where these soils are located, and how they can be used.

They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide uniform procedures. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Downer and Matapeake, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that go with their behavior in the natural, untouched landscape. Soils of one series can differ somewhat in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Matapeake fine sandy loam and Matapeake silt loam are two soil types in the Matapeake series. The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases. The name of a soil phase indicates a feature that affects management. For example, Matapeake fine sandy loam, 0 to 2 percent slopes, is one of several phases of Matapeake fine sandy loam, a soil type that ranges from nearly level to sloping.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that greatly help in drawing boundaries accurately. The soil map in the back of this report was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientists have a problem of delineating areas where different kinds of soils are so intricately mixed, and so small in size, that it is not practical to show them separately on the map. Therefore, they show this mixture of soils as one mapping unit and call it a soil complex. Ordinarily, a soil complex is named for the major kinds of soil in it, for example, Galestown-Lakeland sands, 0 to 5 percent slopes. The undifferentiated soil group is another kind of group that is mapped as a single mapping unit. The soils in this kind of group do not occur in regular geographic association. An example of an undifferentiated soil group in Somerset County is Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes. Also, on most soil maps, areas are shown that are so rocky, so shallow, or so frequently worked by wind and water that they scarcely can be called soils. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Coastal beaches or Tidal marsh, and are called land types rather than soils.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in a way that it is readily useful to different groups of readers, among them farmers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in the soil survey reports. On the basis of yield and practice tables and other data, the soil scientists set up trial groups, and test them by further study and by consultation with farmers, agronomists, engineers, and others. Then, the scientists adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

After study of the soils in a locality and the way they are arranged, a general map can be made that shows areas covered by main patterns of soils, called soil associations. Such a map is the general soil map at the back of this report. Each association, as a rule, contains a few major soils and several minor soils in a pattern that is characteristic but not strictly uniform.

The soils within any one association are likely to differ from each other in slope, natural drainage, and other properties. Thus, the general soil map shows the areas covered by patterns of different kinds of soils, but it does not show the kind of soil at a particular place.

Each soil association is named for the major series in it, but, as already noted, soils of other series may also be present. The major soils in one association may also be present in another association, but in a different pattern.

The general soil map is useful to people who want a general idea of the soils, who want to compare different parts of a county, or who want to know the possible location of good-sized areas suitable for certain kinds of farming or other land use.

Somerset County has six soil associations. Association 4 covers almost one-half of the county and consists mostly of poorly drained and very poorly drained, nearly level silt loams. Soil association 5 amounts to about one-quarter of the county and is marshland, most of which borders estuaries. Very poorly drained to moderately well drained sandy loams are the main soils in soil association 3. The main soils in association 1 are well-drained to poorly drained, nearly level and gently sloping sandy loams. Moderately well drained and well drained, gently sloping to strongly sloping silt loams make up most of association 2. Soil association 6 consists of small, swampy fresh-water areas in the southeastern part of the county.

1. Sassafras-Woodstown-Fallsington association. Well-drained to poorly drained, nearly level and gently sloping sandy loams

Soil association 1 consists dominantly of well drained and moderately well drained soils, but some poorly drained soils are included. The soils in the association are fairly sandy in most places; they developed in beds

of silty sand or clayey sand, or in mixtures of sand, silt, and clay.

This association makes up about 5 percent of the county. It is distributed in the northwestern and northern parts of the county in small, disconnected areas that extend from Deal Island along the south bank of Wicomico River and Wicomico Creek to the point where U.S. Highway No. 13 enters the county from the north.

In addition to the Sassafras, Woodstown, and Fallsington soils, the Downer, Matapeake, Mattapex, Klej, and other soils occur in small areas. Many small areas of different kinds of soils and only a few large uniform areas make up the pattern of soils in this association. The topography is mostly gently sloping, but there are a few steeper areas adjacent to salt water and many almost level areas, particularly of the poorly drained Fallsington soils.

This association is not highly developed agriculturally, though some farms are very good. Most of the farms are small, and many could be classed residential. This soil association is more thickly settled than most other parts of the county. It includes the communities of Wenona, Deal Island, Chance, Dames Quarter, Mount Vernon, Widgeon, Loretto, and Eden. Many people farm as a sideline to their main occupation of fishermen or oystermen.

General crops are grown, as well as some truck crops and fruit. Needed most is improvement in soil fertility and in water management, because most of the soils are sandy, low in productivity, and either too wet or too dry at times. The needs that water management can meet are (1) supplemental irrigation for crops and pasture during dry periods on the well-drained Sassafras and Woodstown soils; and (2) artificial drainage, particularly on the poorly drained Fallsington soils but to some extent on the moderately well drained Woodstown soils. In all of the sloping areas and in some of the nearly level areas, practices are needed to control erosion, particularly water erosion. These practices include contour cultivation and stripcropping, terracing some long slopes, and, especially, protecting the soil by vegetation. This protection can be obtained by using cover crops in the rotations, sodded strips, particularly in waterways, permanent pasture and hay crops, and windbreaks in exposed sandy areas.

2. Matapeake-Mattapex association: Well drained and moderately well drained, gently sloping to strongly sloping silt loams

Soil association 2 is sloping enough and high enough above wet areas to be well drained or moderately well drained. The main soils are gently sloping to strongly sloping silt loams.

This association amounts to about 6 percent of the county, but in it are probably the best areas for general farming. It occurs in two widely separated areas. One area borders the Manokin River from Goose Point to a point above Princess Anne and borders Kings Creek almost to Peggy Boston Swamp. It includes the Stewart Neck area. The other area borders the Pocomoke River. It extends upstream from a point just below Rehobeth to Costen Branch.

The Matapeake soils are well drained, and the Mattapex soils are moderately well drained. These soils occur in about equal amounts.

***Figure 4.*—Harvesting turnip greens near Wagner Landing on the Matapeake-Mattapex soil association.**

Some farms are excellent in this association. Many of them are general farms, but the emphasis is on truck crops (fig. 4). Some fairly large orchards occur, and the production of strawberries is particularly important. Although these deep silty soils retain moisture well, irrigation for truck crops and strawberries should be available at critical periods. The Mattapex soils need simple drainage practices, generally only the removal of surface water during extremely wet periods. Fertility should be well maintained, and in all except the most nearly level areas, erosion control practices should be used.

3. Fallsington-Pocomoke-Woodstown association: Very poorly drained to moderately well drained, nearly level and gently sloping sandy loams

Soil association 3 is probably the most complex soil association in the county, because it is made up of many different kinds of soils. Most areas are very poorly drained or poorly drained, but areas of Woodstown soils are moderately well drained and other areas are very sandy and droughty.

The association amounts to about 11 percent of the county. It lies in the northeastern part along the county line and, in a belt about 5 miles wide, extends southward for a distance of about 11 miles. Its southern edge is just south of Emanuel Church.

Besides the major soils in this association, other soils in this association are the poorly drained Plummer and St. Johns soils, the somewhat poorly drained Leon soils, and the moderately well drained Klej soils. In some places there are small areas of the excessively drained Lakeland soils and the somewhat excessively drained and excessively drained Galestown soils.

Soil association 3 is not used so much for farming as the other associations in the county, because in most of it the soils are wet and difficult to drain or are sandy, droughty, and low in fertility. Some of the soils are wet part of the time and are droughty at other times. This association is largely wooded. It is sparsely settled and has no large communities or towns.

Drainage is the main problem on this association, but there are some very unproductive, very sandy, droughty areas and some areas where erosion control is needed. If

crop production is to be reasonably good, fertility improvement is needed. The production of wood crops probably can be increased by improving woodland management.

4. Othello-Portsmouth association: Poorly drained and very poorly drained, nearly level silt loams

Soil association 4 is the most extensive soil association in the county; it covers nearly half of the land area. It is in a continuous area that extends from the marshland in the southern part of the county to the narrow belt of soil associations that borders the northern boundary. This area also extends from the marshland on the west to the eastern boundary of the county, or to the soil associations bordering that boundary.

Othello and Portsmouth soils make up about 90 percent of the association. The acreage of the poorly drained Othello soils is about four times that of the very poorly drained Portsmouth soils. Also in the association are very poorly drained Pocomoke soils, somewhat poorly drained Dragston soils, well-drained Matapeake and Sassafras soils, and moderately well drained Mattapex soils. The Othello, Portsmouth, Matapeake, and Mattapex soils developed in the same kind of parent material—a mantle of silty material over a sandier substratum. The Matapeake and Mattapex soils generally do not need drainage and are better suited for farming than the Othello and Portsmouth soils.

But drainage is needed in most of this association. The drainage systems required are complex, expensive to install, and difficult to maintain. Because Portsmouth soils are wetter than Othello soils, they are more difficult to drain, and their drainage system is more difficult to maintain.

Drained areas of these soils are suitable for most agricultural purposes. They are used for general farming, pasture, and truck crops. In Somerset County a large acreage near Marion is in truck crops, particularly tomatoes. Erosion generally is not a problem on the soils of this association, but fertility should be well maintained. Less intensive drainage practices are needed on pasture than on cropland, but the best pastures probably are in the more intensively drained areas in which crops and pasture are grown in rotations. Undrained areas are mostly wooded. Some stands of loblolly pine are excellent, particularly those on the Othello soils. Better yields probably would be obtained if woodland management were improved.

5. Tidal marsh association: Salt water marshland bordering estuaries and on islands

Soil association 5 consists almost entirely of the tidal marshland of the county. This marshland cannot be used for crops or pasture, but it does benefit wildlife, particularly migratory waterfowl and muskrats.

The association makes up about 26 percent of the county. It occurs in some large continuous areas and in many small discontinuous ones. These areas are adjacent to salt water along the mainland and on islands of the bays and estuaries.

6. Swamp-Muck and peat association: Wet lands of fresh water areas

Soil association 6 consists of areas that have been made very wet by fresh water. These areas consist mostly of swampy materials and some deposits of muck and peat. Also in the association are very poorly drained Portsmouth soils and wet areas of Mixed alluvial land.

This association makes up about 2 percent of the county and occurs mostly along the Pocomoke River. Most of the association has little agricultural value, but some timber, mostly gum and cypress, is produced. Also, this association provides excellent areas for sheltering wildlife.

Descriptions of the Soils

This section describes the soil series (groups of soils) and single soils (mapping units) of Somerset County. The acreage and proportionate extent of each mapping unit are given in table 3.

The procedure in this section is first to describe the soil series, and then the mapping units in the series. Thus, to get full information on any one mapping unit, it is necessary to read the description of that unit and also the description of the soil series to which it belongs. As mentioned in the section "How Soils Are Mapped and Classified," not all mapping units are members of soil series. Coastal beaches and Tidal marsh are miscellaneous land types and do not belong to a soil series, but, nevertheless, are listed in alphabetic order along with the soil series.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit are the capability unit and woodland suitability group in which the mapping unit has been placed. The irrigation group and drainage group are also listed if the mapping unit has been placed in these groups. The page numbers showing where each of these interpretive groups is described can be found readily by referring to the "Guide to Mapping Units" at the back of the report.

Soil scientists, engineers, students, and others who want detailed descriptions of soil series should turn to the section "Formation and Classification of Soils." Many terms in the soil descriptions and other sections of the report are defined in the Glossary.

The soils of Somerset County can be considered in three broad groups according to their position on the landscape: Soils of the uplands (about 71 percent of the land area in the county), soils of the flood plains (about 1 percent of the county), and swamps and marshes (about 28 percent of the county). Within these topographic groups, the soils vary according to the parent material from which they formed and according to their drainage. These relationships among the soil series are shown in table 4. Swamps and marshes are not included in table 4, because their soil material has not been affected much by soil development, and they have not been mapped in detail.

TABLE 3.—*Approximate acreage and proportionate extent of the soils mapped*

Map symbol	Soil	Area	Extent
		Acres	*Percent*
Cb	Coastal beaches	583	0. 3
DoA	Downer loamy sand, 0 to 2 percent slopes	105	([1])
DoB	Downer loamy sand, 2 to 5 percent slopes	1, 079	. 5
DoC	Downer loamy sand, 5 to 10 percent slopes	113	([1])
DoC3	Downer loamy sand, 5 to 10 percent slopes, severely eroded	63	([1])
Fa	Fallsington loam	5, 772	2. 7
Fb	Fallsington sandy loam	8, 961	4. 2
FdA	Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes	3, 664	1. 7
FdB	Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes	572	. 3
FgA	Fallsington and Dragston loams, 0 to 2 percent slopes	2, 349	1. 1
FgB	Fallsington and Dragston loams, 2 to 5 percent slopes	366	. 2
GcB	Galestown loamy sand, clayey substratum, 0 to 5 percent slopes	525	. 2
GlB	Galestown-Lakeland sands, 0 to 5 percent slopes	322	. 2
GlC	Galestown-Lakeland sands, 5 to 10 percent slopes	156	([1])
Gp	Gravel and borrow pits	99	([1])
Jo	Johnston loam	1, 851	. 9
KfA	Keyport fine sandy loam, 0 to 2 percent slopes	190	([1])
KmA	Keyport silt loam, 0 to 2 percent slopes	303	. 1
KnA	Klej loamy sand, 0 to 2 percent slopes	1, 707	. 8
KnB	Klej loamy sand, 2 to 5 percent slopes	523	. 2
LaB	Lakeland loamy sand, clayey substratum, 0 to 5 percent slopes	129	([1])
LgB	Lakeland-Galestown loamy sands, clayey substratum, 2 to 5 percent slopes	320	. 2
LmC	Lakeland-Galestown loamy sands, 5 to 10 percent slopes	126	([1])
Lo	Leon loamy sand	113	([1])
Ma	Made land	370	. 2
MfA	Matapeake fine sandy loam, 0 to 2 percent slopes	848	. 4
MfB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded	2, 498	1. 2
MfC	Matapeake fine sandy loam, 5 to 10 percent slopes	78	([1])
MkA	Matapeake silt loam, 0 to 2 percent slopes	4, 629	2. 2
MkB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded	3, 174	1. 5
MkC2	Matapeake silt loam, 5 to 10 percent slopes, moderately eroded	106	([1])
MkC3	Matapeake silt loam, 5 to 10 percent slopes, severely eroded	89	([1])
MkD	Matapeake silt loam, 10 to 15 percent slopes	54	([1])
MpA	Mattapex fine sandy loam, 0 to 2 percent slopes	1, 339	0. 6
MpB2	Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded	677	. 3
MsA	Mattapex silt loam, 0 to 2 percent slopes	8, 047	3. 8
MsB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded	1, 892	. 9
Mx	Mixed alluvial land	416	. 2
My	Muck and peat	1, 598	. 8
OhA	Othello silt loam, 0 to 2 percent slopes	48, 260	22. 7
OhB2	Othello silt loam, 2 to 5 percent slopes, moderately eroded	222	. 1
Om	Othello silt loam, low	1, 644	. 8
Oo	Othello silt loam, silty substratum	3, 008	1. 4
Os	Othello silty clay loam	12, 488	5. 9
Ot	Othello silty clay loam, silty substratum	142	([1])
Pd	Plummer loamy sand	310	. 1
Pk	Pocomoke loam	6, 047	2. 8
Pm	Pocomoke sandy loam	2, 621	1. 2
Po	Portsmouth loam	1, 135	. 5
Pr	Portsmouth silt loam	13, 891	6. 5
Sa	St. Johns loamy sand	100	([1])
SfA	Sassafras sandy loam, 0 to 2 percent slopes	599	. 3
SfB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded	2, 664	1. 3
SfC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded	215	. 1
SfC3	Sassafras sandy loam, 5 to 10 percent slopes, severely eroded	168	([1])
SfD	Sassafras sandy loam, 10 to 15 percent slopes	111	([1])
St	Steep sandy land	204	([1])
Sw	Swamp	3, 421	1. 6
Tm	Tidal marsh	54, 986	26. 0
WdA	Woodstown loam, 0 to 2 percent slopes	472	. 2
WdB2	Woodstown loam, 2 to 5 percent slopes, moderately eroded	205	([1])
WoA	Woodstown sandy loam, 0 to 2 percent slopes	2, 419	1. 1
WoB2	Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded	1, 341	. 6
	Total	212, 480	100. 0

[1] Less than 0.1 percent.

TABLE 4.—*Relationships of the soils according to topographic position, parent material, and drainage*

Position and parent material	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
Uplands:							
Sand and loamy sand.	Galestown, Lakeland.[1]	Galestown, Lakeland.[1]		Klej	Leon [2]	Leon, Plummer.[2]	St. Johns.
Sand, silt, and clay.			Downer, Sassafras.[3]	Woodstown	Dragston	Fallsington	Pocomoke.
Silt deposited over sand.			Matapeake	Mattapex		Othello	Portsmouth.
Clay and silty clay.				Keyport			
Flood plains:							
Sand, silt, and clay.							Johnston.

[1] The Galestown and Lakeland soils are somewhat excessively drained and excessively drained. The color of the sandy parent material is the main difference between these two kinds of soils.
[2] The Leon soils are somewhat poorly drained and poorly drained. The Leon soils have a subsoil of organic-iron hardpan and Plummer soils do not.
[3] The material in which the Downer soils formed is somewhat less silty and clayey than that in which Sassafras soils formed.

Coastal Beaches

Coastal beaches (Cb) are measurable sandy areas along the shores of the Chesapeake Bay and some of the larger rivers and estuaries. They consist of incoherent loose sand that has been worked and reworked by waves and tides and by winds, and that is likely to be reworked again at fairly frequent intervals. The soil material is sand that shows no soil development and supports little, if any, vegetation. American beachgrass and beach goldenrod grow in some places, and there are a few clumps of switchgrass. On partly stabilized areas, there is some loblolly or Virginia pine.

Coastal beaches include all of the mappable beaches in the county. Although a few trees grow, the beaches have no value for farming. They have a smooth surface or are somewhat hummocky and have short slopes. Figure 5 shows a method for checking excessive beach erosion. (Capability unit VIIIs-2; woodland group 20.)

Figure 5.—**Pilings and old tire casings used to check erosion caused by waves and tides.**

Downer Series

The Downer series consists of well-drained soils that have a thick surface layer and a brown to reddish-brown or yellowish-red subsoil somewhat finer textured than the surface layer. These soils are on nearly level to moderately sloping uplands, mostly in the northern part of the county. They overlie loose, very sandy material and show no evidence of wetness or of a high water table. The native vegetation consists of upland hardwoods, mostly oak, but there are scattered almost pure stands of loblolly pine and of Virginia pine, or mixed stands of these two species.

The plow layer, about 8 to 10 inches thick, is grayish-brown, loose, very crumbly loamy sand. The subsurface layer extends to a depth of about 16 inches and is much the same as the surface layer except that it is pale brown. The upper subsoil is heavy sandy loam and contains distinctly more clay than the layers above. Although it is slightly sticky when wet, it crumbles readily. The upper subsoil is generally dark brown, but in some places it is reddish brown or yellowish red. The lower subsoil, between depths of 20 and 30 inches, is much the same as the upper subsoil, but it contains more sand and less clay. Beneath the subsoil is very sandy material, normally brown but of different colors in many places.

In some places the surface layer and subsurface layer combined are up to 24 inches thick, and in other places the subsoil is thinner than that described.

Unlimed areas of Downer soils are strongly acid or very strongly acid, but in Somerset County most cultivated areas have been limed, especially those intensively used for truck crops. These soils have low available moisture capacity, are never more than slightly wet, and warm quickly in spring. They are easy to work. Some of the earliest maturing truck crops in the county grow on Downer soils.

These soils are suited to most crops commonly grown in the county and to other agricultural uses. They tend to dry to a considerable depth in droughty periods. Supplemental irrigation may be important in areas used for

Figure 6.—**Sand blown from an unprotected field of Downer loamy sand and deposited in a layer that is 11 inches thick at the edge of the field.**

truck crops or other crops of high value. Because these soils do not retain plant nutrients well, many crops frequently receive large applications of fertilizer, but under good management, fairly high yields are produced. Because water enters and passes through these soils readily, erosion generally is only a minor problem. Blowing, however, is a serious problem in unprotected areas during dry, windy periods. Although slope is a limitation on the steeper areas, limitations are few if these soils are used as building sites or for disposal of sewage from septic tanks.

The Downer soils are not so loose and sandy as the Galestown and the Lakeland soils, and the loose soil does not extend so deeply. They are similar to the Sassafras soils in surface appearance, but they have a thicker surface layer and a thinner subsoil and are more sandy, particularly in the surface layer.

Figure 6 shows a fall-plowed field of Downer soils that was damaged by blowing when it was left unprotected through the winter.

Downer loamy sand, 0 to 2 percent slopes (DoA).—This soil has a profile like the one described for the Downer series. Drainage and water erosion are not problems, and blowing is likely only in exposed areas during dry, windy periods. This soil is valuable for farming, particularly growing of truck crops, but its use is limited by the low moisture capacity and low natural fertility that are caused by the sandiness of the thick surface layer. (Capability unit IIs–4; irrigation group 3; woodland group 7.)

Downer loamy sand, 2 to 5 percent slopes (DoB).—In many characteristics this soil is similar to Downer loamy sand, 0 to 2 percent slopes, but it is more sloping and therefore more susceptible to loss of soil by washing. A significant amount of surface soil has been lost, but the loss is not critical and can be checked by simple conservation measures. The sandiness of the remaining surface soil generally affects management more than the risk of erosion. This is the most extensive and most important Downer soil in Somerset County. (Capability unit IIs–4; irrigation group 3; woodland group 7.)

Downer loamy sand, 5 to 10 percent slopes (DoC).—In places a fair amount of the original surface layer of this strongly sloping soil has been lost through erosion, but these areas can still be cultivated regularly. Preventing further erosion is probably the most important management problem, but even if erosion were checked, the soil would still be low in fertility and in moisture capacity. (Capability unit IIIe–33; irrigation group 3; woodland group 8.)

Downer loamy sand, 5 to 10 percent slopes, severely eroded (DoC3).—Except for the severe loss of surface soil through wind or water erosion, or both, this soil is essentially the same as Downer loamy sand, 5 to 10 percent slopes. In many places plowing to a normal depth turns up some of the brownish or reddish subsoil, and in some places the subsoil is almost exposed. Locally, there are a few shallow gullies. If, however, special protective measures are used and management is good, crops can be grown with some regularity. (Capability unit IVe–5; irrigation group 3; woodland group 13.)

Dragston Series

The Dragston series consists of somewhat poorly drained, brownish, moderately sandy soils that are mottled or spotted fairly near the surface. Water moves through these soils readily, but for fairly long periods the water table is near the surface. These soils are in the uplands, mainly on flats but also on gentle slopes. The principal native vegetation is red maple, sweetgum, oak, and other hardwoods. Loblolly pine has invaded some areas.

The plow layer is dark grayish-brown loam or fine sandy loam in most places. It is only slightly sticky and crumbles readily. In wooded areas the surface layer is very dark brown or grayish brown and is about 1 to 4 inches thick, and the subsurface layer is olive brown. The subsoil, to a depth of about 26 inches, is heavy fine sandy loam or fine sandy clay loam that is commonly more sticky than the surface layer. It ranges from brownish gray to olive or olive brown and is spotted or mottled with olive brown or yellowish brown at a depth of 12 to 15 inches. The subsoil is underlain by gray fine sand that is more or less loamy and is commonly mottled or streaked with yellowish brown.

The Dragston soils are very strongly acid or extremely acid, unless they have been limed. They are easy to work when they are not wet, but they are wet in winter and late in spring unless they are artificially drained. Wetness delays planting so much that crops mature late and cannot be harvested until late in fall or early in winter when these soils may be wet again. Available moisture capacity is moderate.

Although these soils are wet part of the year, they tend to dry out during long dry warm periods. During these periods, supplemental irrigation is needed for obtaining favorable yields. In areas that are intensively farmed, large amounts of fertilizer are commonly applied, though these soils retain plant nutrients fairly well.

Use of these soils is limited chiefly by impeded drainage and by a seasonally high water table. These limitations affect the suitability of these soils as sites for permanent buildings, and septic tanks do not dispose sewage properly during the wettest periods. Erosion is not serious in the level or nearly level areas, but it may be on the gentle slopes.

In Somerset County the Dragston soils occur mostly within larger areas of the Fallsington soils, and they are mapped only in undifferentiated units with them. The Dragston soils are not quite so wet as the Fallsington soils and have a lower water table.

Fallsington Series

The Fallsington series consists of poorly drained, grayish, moderately sandy soils that have a mottled or spotted subsoil. Water moves through these soils readily, but the water table is at or near the surface for long periods. These soils are on upland flats, mostly in the northeastern and northern parts of the county. The principal native vegetation is red maple, sweetgum, and other wetland hardwoods, though in some areas of trees there is a considerable amount of second-growth loblolly pine.

The plow layer is dark grayish-brown sandy loam, fine sandy loam, or loam that is only slightly sticky and crumbles readily. In wooded areas the dark-gray or dark grayish-brown surface layer is about 2 to 4 inches thick and is lighter colored than the subsurface layer. The subsoil, to a depth of about 3 feet, is heavy sandy loam or sandy clay loam that generally is more sticky than the surface layer. In most places it is light gray to pale olive and is spotted or mottled with yellowish brown. The subsoil is underlain by light-gray, loose sand that is mottled with yellowish brown. In some places, however, these soils are almost a uniform gray beneath the surface layer, and there is little or no mottling.

In uncultivated areas these soils are very strongly acid, but most of the intensively cultivated areas have been limed. These soils are easy to work when they are not too wet, but they are wet in winter and late in spring unless they are artificially drained. Available moisture capacity is moderate. Wetness frequently delays planting so much that crops mature late and cannot be harvested until late in fall or early in winter when these soils may be wet again.

These soils tend to dry out during long dry periods in summer. During these periods, supplemental irrigation is desirable and may be necessary if yields are to be favorable. Although plant nutrients are retained fairly well, large amounts of fertilizer are commonly applied in fields that are intensively farmed.

These soils are limited in use chiefly by poor drainage and a seasonally high water table. They are too wet to be used as sites for permanent buildings. During wet periods, septic tanks in these soils do not function. Erosion generally is not a serious problem, but the soil surface should not be left unprotected for long periods.

The Fallsington soils are similar to the Othello soils in color and in drainage but contain much less sand and more silt. They formed in the same kind of material as the Sassafras, Woodstown, Pocomoke, and Dragston soils. Fallsington soils are not so wet as the black Pocomoke soils but are wetter than the Sassafras, Woodstown, and Dragston soils.

Fallsington loam (Fa).—The plow layer of this soil is loam. Most areas are nearly level, but a few small areas are gently sloping. In this county this soil is extensive and important to agriculture. If it is adequately drained, it is suited to the crops commonly grown in the area. Under good management, crop yields are fairly high. (Capability unit IIIw-7; drainage group 7-A; irrigation group 13; woodland group 1.)

Fallsington sandy loam (Fb).—This soil is the most extensive Fallsington soil in the county. It is level or nearly level in most places, but some spots are gently sloping. It has a sandier plow layer than Fallsington loam. Drained areas are easy to work and are suited to most crops grown in the area. Drainage is not difficult where outlets are available. In most places tile or ditches work well. (Capability unit IIIw-6; drainage group 7-B; irrigation group 9; woodland group 1.)

Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes (FdA).—In this mapping unit Fallsington fine sandy loam and Dragston fine sandy loam were mapped together in fairly large areas because the soils are so much alike that mapping them separately serves no useful purpose. These soils are finer textured than Fallsington sandy loam. The Dragston soil is like the soil described for the Dragston series. It occurs on slightly elevated, flat-topped ridges within larger areas of Fallsington fine sandy loam. It is not quite so wet as the Fallsington soil, but it can be managed in the same way. (Fallsington soil: capability unit IIIw-6; Dragston soil: capability unit IIw-5. Both soils in drainage group 7-B; irrigation group 9; woodland group 1.)

Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes (FdB).—These soils are more sloping than Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes, and have somewhat better surface drainage. Though erosion is a slight hazard in unprotected areas, drainage is the main management problem. On these soils a drainage system different from that on more nearly level soil is needed. Tile and interceptor ditches are placed across the slopes to divert and collect runoff water. (Fallsington soil: capability unit IIIw-6; Dragston soil: capability unit IIe-36. Both soils in drainage group 7-B; irrigation group 9; woodland group 1.)

Fallsington and Dragston loams, 0 to 2 percent slopes (FgA).—These soils are more difficult to drain than Fallsington and Dragston fine sandy loams and are slower to warm up in spring, but they store more moisture that is available to plants during dry periods. Improving drainage is the main management problem. Ditches and tile can be more closely spaced than in the sandier soils. (Fallsington soil: capability unit IIIw-7; Dragston soil: capability unit IIw-1. Both soils in drainage group 7-A; irrigation group 13; woodland group 1.)

Fallsington and Dragston loams, 2 to 5 percent slopes (FgB).—These soils have stronger slopes than Fallsington and Dragston loams, 0 to 2 percent slopes, and they are slightly eroded. Undrained areas are too wet for most crops, but if adequately drained and protected against further erosion, these soils are suitable for most agricultural uses. (Fallsington soil: capability unit IIIw-7; Dragston soil: capability unit IIe-16. Both soils in drainage group 7-A; irrigation group 13; woodland group 1.)

Galestown Series

The Galestown series consists of somewhat excessively drained or excessively drained, droughty, very sandy soils that generally have a strong-brown subsoil. These soils are on nearly level to moderately sloping or rolling

uplands, mostly in the northern part of the county. In some of the more nearly level areas, material that is finer textured than the layers above occurs at a depth of a few feet. This material helps to retain moisture. The more strongly sloping areas are dunelike and have loose sand extending to a considerable depth. Scrub hardwoods, including many oaks, are the main native trees, but there is some Virginia pine.

In cultivated areas the plow layer, to a depth of about 10 inches, is brown or grayish-brown, very crumbly sand or loamy sand. In wooded areas the surface layer is somewhat thinner than the plow layer and commonly is grayer. The subsoil is very crumbly loamy sand that is yellowish brown to a depth of about 24 inches and strong brown between about 24 and 40 inches. The subsoil is underlain by loose yellow sand to a depth of 5 feet or more. Finer textured material occurs at a depth of 5 or 6 feet in the loamier nearly level areas.

The subsoil ranges from brown to yellowish red. Its upper part is mixed into the plow layer in those places where some of the original surface layer has washed or blown away.

In undisturbed areas these soils are strongly acid or very strongly acid, but in some of the cultivated areas liming has reduced acidity. These soils are easy to work and are never too wet for tillage. They have low or very low available moisture capacity. Because they warm up so quickly in spring, they are planted to some of the earliest maturing crops grown in the county.

If supplemental irrigation is used and fertility is maintained, Galestown soils are suited to many kinds of cultivated crops and to most other agricultural uses. Although the available moisture capacity is low or very low in areas having a finer textured underlying layer, moisture is retained that can be used by crops, particularly deep-rooted crops. During hot summers these soils generally dry out so much that crops are damaged unless they are irrigated. Because plant nutrients are not retained well, large amounts of fertilizer are frequently applied, particularly on fields in truck crops. Because water enters and passes through these soils rapidly, water erosion is a secondary hazard. These sandy soils, however, blow readily if they are dry and unprotected during windy periods. Slope and sandiness slightly limit the use of these soils as building sites or for septic tanks.

In this county areas that are distinctly Galestown soils occur, but in places these soils are intricately intermingled with the Lakeland soils. The two kinds of soils are much alike except that the subsoil of Galestown soils is browner than that of Lakeland soils. In some places Galestown soils grade to the moderately well drained Klej soils, which have a mottled, sandy lower subsoil and a fluctuating water table.

Galestown loamy sand, clayey substratum, 0 to 5 percent slopes (GcB).—This soil has a surface layer and subsoil of loamy sand and a finer textured, moisture-retaining layer within 5 or 6 feet of the surface. It ranges from level to gently sloping, but slopes are somewhat uneven in a few places. This soil is especially desirable for some truck crops, particularly melons and cucumbers. It produces fairly good yields if special practices are used to maintain fertility and to conserve moisture, and if supplemental irrigation is used during dry periods. (Capability units IIIs–1; irrigation group 1; woodland group 5.)

Galestown-Lakeland sands, 0 to 5 percent slopes (GlB).—In this complex are Galestown soils and Lakeland soils that consist almost entirely of sand. The soils are so intermingled that they cannot be shown separately on the soil map. The Galestown soil occupies a larger acreage than the Lakeland soil. Although these soils are level to gently sloping, slopes are uneven in some places. In most places these soils contain practically no silt or clay and do not have a moisture-retaining clayey substratum.

These soils are droughty and are low in natural fertility and productivity, but they are used for watermelons and other special crops. Except for these special crops, these soils are used little for agriculture in this county. (Capability unit VIIs–1; irrigation group 1; woodland group 5.)

Galestown-Lakeland sands, 5 to 10 percent slopes (GlC).—These soils are moderately sloping to strongly sloping. Some areas have many small sandy hills or ridges and some sinklike depressions. These soils are used little for agriculture in this county. (Capability unit VIIs–1; irrigation group 1; woodland group 5.)

Gravel and Borrow Pits

Gravel and borrow pits (Gp) are areas from which the soil has been completely removed. The soil has been used for fill material, mostly in roads, or the underlying gravel has been excavated and used for construction materials. After removal of the soil, gravel, or both, the floor of the pits is gravel, sand, or clay. The floor of the borrow pits just east of Princess Anne is partly boulders. In fairly large areas near Princess Anne, the soils are underlain by gravelly material that does not have a uniformly high content of gravel. These areas, however, are important sources of gravel because material suitable for construction is scarce in low coastal areas.

Most areas of this land type are not used for agriculture, but in some places trees have been planted or have volunteered, and a few small areas have been planted to strawberries or other cultivated crops. The pits are so variable that each area must be examined before its suitabilty can be determined. Some of the deeper pits have been made into ponds and used for fishing, swimming, and other recreation (fig. 7). (Capability unit VIIIs–4; woodland group 21.)

Figure 7.—**A community recreational area that was developed from a 4-acre borrow pit.**

Johnston Series

In the Johnston series are very poorly drained, very dark colored soils on flood plains that are likely to be flooded at irregular intervals. These soils consist of alluvium washed from soils on the uplands. They have a thick, black surface layer in which a considerable amount of organic matter has accumulated. The native vegetation is mostly red maple, gum, holly, pond pine, and various kinds of oak.

In this county most of the Johnston soils are black loam to a depth of about 24 to 30 inches. These soils contain a large amount of fine organic matter and in places are somewhat silty within a few inches of the surface. Apparently, a B horizon has not developed. The material underlying the thick surface layer varies from place to place but is brownish-gray sand or loamy sand in most places.

The Johnston soils are very strongly acid or extremely acid unless they have been limed. These soils are fairly easy to work when they are not too wet, but they are commonly very wet in winter and late in spring. In addition, the water table is at or above the surface at times. The available moisture capacity is high. Because these soils are wet and are subject to flooding, planting is commonly delayed.

If these soils are adequately drained and carefully managed, they are moderately productive of most crops grown in the county. Use is limited by very poor drainage, a seasonally high water table, and the hazard of flooding. These soils are severely limited in their use as building sites and for septic tanks.

The Johnston soils are similar to the Pocomoke and the Portsmouth soils, but Johnston soils occur on flood plains instead of uplands and lack a gray, mottled, well-developed subsoil.

Johnston loam (Jo).—This is the only Johnston soil mapped in this county. It is difficult to drain and to protect from flooding. Its native vegetation of wetland forest is difficult and expensive to clear. However, if this soil is adequately drained and protected from flooding, it can be regularly cultivated to corn, soybeans, some vegetables, and other cultivated crops. Included in areas mapped as this soil are spots that have a fairly sandy surface layer. (Capability unit IIIw-7; drainage group 11-A; irrigation group 10; woodland group 2.)

Keyport Series

The Keyport series consists of moderately well drained soils that occur on nearly level uplands and have a brownish, clayey subsoil that is mottled in the lower part. The water table is fairly high during the wettest periods, and water moves through the subsoil very slowly. The native vegetation consists chiefly of various kinds of oaks, and there are some sweetgums and red maples.

The plow layer, to a depth of 8 to 10 inches, is generally dark grayish-brown fine sandy loam or silt loam that is crumbly and slightly sticky. In wooded areas this dark-colored layer is only 1 to 4 inches thick and is underlain by a somewhat lighter colored subsurface layer. The subsoil is normally yellowish-brown or brownish-yellow silty clay to a depth of about 20 inches. Many brighter and grayer mottles occur below that depth. The subsoil extends to 40 inches. It is more sticky in the upper part than in the lower few inches, where there is slightly more sand. The underlying material varies in texture and color, but in most places it is more sandy than the subsoil.

These soils are very strongly acid or extremely acid unless they have been limed. Their available moisture capacity is fairly high. When the moisture content is favorable, these soils are fairly easy to work unless the plow penetrates into the tough, sticky, clayey subsoil. These soils are fairly slow to warm up in spring, and planting may be slightly late.

Under good management these soils are suited to many crops commonly grown in the county. Water moves through them very slowly, particularly through the subsoil. The management should improve drainage, for these soils are difficult to work even where they are only slightly wet. They are difficult to drain by tile because tile does not work well in the sticky, clayey subsoil. Only open ditches should be used. Seasonal wetness and the clayey subsoil limit the use of these soils as building sites and for septic tanks.

In Somerset County only the Keyport soils formed in fine clay. They much resemble the Woodstown and the Mattapex soils, but the Woodstown soils have a fairly sandy subsoil, and the Mattapex soils have a highly silty subsoil. Water moves much more slowly through the Keyport soils than through the Mattapex and Woodstown soils.

Keyport fine sandy loam, 0 to 2 percent slopes (KfA).—In this moderately well drained soil, the fine sandy loam surface layer extends at least to normal plow depth. Drainage is needed before many of the crops common in the area can be grown. In a few included gently sloping areas, there is a slight erosion hazard. (Capability unit IIw-9; drainage group 6-2B; irrigation group 8; woodland group 11.)

Keyport silt loam, 0 to 2 percent slopes (KmA).—This is the only Keyport soil in Somerset County that has a silty plow layer. It has about the same uses as Keyport fine sandy loam, 0 to 2 percent slopes, and requires about the same management, but it is somewhat harder to work and to drain. (Capability unit IIw-8; drainage group 6-2A; irrigation group 12; woodland group 11.)

Klej Series

Soils of the Klej series are moderately well drained and sandy throughout. Water moves through them fairly rapidly, but the water table fluctuates seasonally between 2 and 4 feet. These soils occur on level to gently sloping uplands, mostly in the northern part of the county. The native vegetation consists largely of mixed oaks but includes some sweetgum, red maple, holly, and scattered pine.

The plow layer, to a depth of about 10 inches, is olive-gray to grayish-brown loamy sand. In wooded areas there is a very thin, olive-gray surface layer and a somewhat thicker subsurface layer that is normally light olive brown. Between depths of 10 and about 20 inches the soil material is olive-yellow, loose loamy sand, and between 20 and 30 inches it is brownish-yellow, loose sand

that is mottled or spotted with a lighter color. Below 30 inches the sand is pale yellow to light brownish gray, generally mottled prominently with brownish yellow.

The depth to mottling ranges from about 15 to 24 inches. In most places material finer textured than loamy sand occurs within a depth of 6 feet, but in some areas this underlying material is at a greater depth.

These soils are normally very strongly acid or extremely acid, but they have been limed in some places. Available moisture capacity is low. In areas close to salt water, these soils may be less acid at a depth of 3 feet than they are above that depth. Even when these soils are wet, they are easy to work, but planting is sometimes delayed in fields that have not been drained.

Under good management, these soils produce favorable yields of corn, soybeans, and many kinds of truck crops. Although available moisture is low, moisture is supplied to plants, at least deep-rooted ones, by a water table that falls below a depth of 4 feet only in extremely dry periods. At times, however, some fields are so dry that all crops, particularly shallow-rooted ones, benefit from supplemental irrigation. Because plant nutrients are not retained well, large amounts of fertilizers are applied fairly often for some kinds of crops. The impeded drainage and seasonally high water table limit the use of these soils for building sites and septic tanks. The septic tanks work well enough in extremely dry periods, but they work poorly or not at all when the water table is high.

The Klej soils somewhat resemble the Woodstown soils but have a lighter colored, sandier surface layer than those soils and lack their finer textured subsoil.

Klej loamy sand, 0 to 2 percent slopes (KnA).—This nearly level soil can be cultivated regularly if it is adequately drained and fertilized. Tile is commonly used for drainage, which is fairly easy in most places. Included in mapped areas are a few spots in which the subsoil has more silt or clay than the soil described as typical of the Klej series. (Capability unit IIIw–10; drainage group 4; irrigation group 1; woodland group 3.)

Klej loamy sand, 2 to 5 percent slopes (KnB).—This soil is more sloping than Klej loamy sand, 0 to 2 percent slopes, and has better surface drainage. Although erosion is a slight hazard, impeded internal drainage and a seasonally high water table are the main management problems. In some places tile or interceptor ditches are needed to collect water from runoff and from downslope seepage and to divert the water into drainage channels. Included in the areas mapped are a few small areas that have slopes of more than 5 percent. (Capability unit IIIw–10; drainage group 4; irrigation group 1; woodland group 3.)

Lakeland Series

The Lakeland series consists of somewhat excessively drained and excessively drained, very sandy soils that occur on uplands and have a subsoil of yellow or light yellowish brown. These soils are in nearly level to moderately sloping or rolling areas, mostly in the northern and northeastern parts of the county. In some of the more nearly level areas, at a depth of a few feet, Lakeland soils are underlain by finer textured material that helps to retain moisture, but in the more strongly sloping, dunelike areas, loose sand apparently extends to a great depth. The native vegetation consists mostly of blackjack oak and other scrub hardwoods, and there is considerable Virginia pine in some areas.

The plow layer of these soils extends to about 10 inches and is grayish-brown or light brownish-gray, loose loamy sand or sand. In wooded areas the surface layer is thinner and, in some places, a little darker than the plow layer. Commonly, a subsurface layer extends to a depth of about 18 inches; it consists of light yellowish-brown sand or loamy sand. The upper subsoil extends to about 36 inches and is light yellowish-brown sand or loamy sand. The lower subsoil is pale-yellow sand and extends to a depth of about 52 inches. Beneath the subsoil, in some places, pale-yellow or light-yellow sand extends to a great depth. In other places a layer of light-gray sandy clay loam occurs at a depth of about 5 to 6 feet.

Unlimed areas of Lakeland soils are strongly acid to extremely acid, but in some intensively cultivated areas acidity has been decreased by adding lime. These soils are easy to work, are never too wet for tillage, and perhaps are the first soils in the county to warm enough in spring for early planting. Available moisture capacity is low or very low.

Except in the steeper areas, the Lakeland soils are suited to most crops commonly grown in the county and to other uses. Although the available moisture capacity is low or very low, areas with the deep, finer textured layer are less droughty than areas where sand extends to a depth of 6 feet or more. These soils tend to dry quickly, and they need supplemental irrigation if they are cultivated. Because plant nutrients are not held well, large amounts of fertilizer are applied frequently, particularly to truck crops or other crops of high value. Partly because water moves rapidly through Lakeland soils, water erosion generally is only a minor problem.

If these soils are dry and unprotected, winds blow them easily. The dunelike appearance of some areas was probably caused by blowing. Although these soils are loose, they have few limitations as building sites or for septic tanks, but there are some limitations caused by slope and extreme sandiness.

Areas of these soils are almost entirely Lakeland soils in some places, but in others they are intricately intermingled with Galestown soils. The soils of these two series are fairly similar, but the subsoil of Lakeland soils is yellow to light yellowish brown, and that of the Galestown soils is strong brown to yellowish red. In some places the Lakeland soils grade toward Klej soils, which are only moderately well drained and have a fluctuating water table and mottling in their sandy lower subsoil.

Lakeland loamy sand, clayey substratum, 0 to 5 percent slopes (LaB).—In this soil the surface layer and the upper subsoil are loamy sand, and a finer textured, moisture-retaining layer occurs within 5 or 6 feet of the surface. This soil ranges from level to gently sloping and in some places has an irregular, hummocky surface that shows evidence of drifting.

This soil is not very productive without good, intensive management, including heavy fertilization and the use of supplemental irrigation in dry periods. Where this soil is farmed, it is used chiefly for truck crops, especially melons and cucumbers. (Capability unit IIIs–1; irrigation group 1; woodland group 5.)

Lakeland-Galestown loamy sands, clayey substratum, 2 to 5 percent slopes (LgB).—This mapping unit consists of Lakeland loamy sand and Galestown loamy sand that are so intricately intermingled that they cannot be separated on the soil map. The mapped areas contain more Lakeland soil than Galestown soil. The plow layer and upper subsoil are loamy sand, and the finer textured, moisture-retaining layer is within 5 or 6 feet of the surface in most places. In some areas slopes are fairly irregular and hummocky. (Capability unit IIIs–1; irrigation group 1; woodland group 5.)

Lakeland-Galestown loamy sands, 5 to 10 percent slopes (LmC).—This mapping unit has about the same proportion of Lakeland soils and Galestown soils as has Lakeland-Galestown loamy sands, clayey substratum, 2 to 5 percent slopes, but slopes are stronger and less uniform The landscape resembles a series of low dunes in some places. Because the underlying moisture-retaining layer is more than 6 feet from the surface in most places, these soils are droughtier than the more gently sloping Lakeland-Galestown loamy sands.

This mapping unit is farmed very little, for most of it is still in trees. In a few included areas slopes are more than 10 percent. (Capability unit VIIs–1; irrigation group 1; woodland group 5.)

Leon Series

The Leon series consists of somewhat poorly drained or poorly drained, gray, sandy soils that have a dark-brown, hard subsoil. The subsoil, commonly called hardpan, is locally called Indian hearth because dried slabs of it have been used as a substitute for stones in rude outdoor fireplaces. These soils occur in sands of the uplands on flats or in slight depressions. They have a moderately high water table that, except in extremely dry or wet periods, fluctuates within a fairly narrow range. The native vegetation consists mainly of wetland hardwoods, mostly red maple and silver maple, but there is some pond pine and loblolly pine. The undergrowth is holly, huckleberry, grasses, sedges, and herbs.

In undisturbed areas the surface layer, 3 to 12 inches thick, is dark-gray, loose loamy sand that contains enough white sand to have a salt-and-pepper appearance in some places. In most cultivated areas this layer is generally a somewhat lighter gray. A subsurface layer of gray to almost white, loose loamy sand extends to a depth of about 20 inches or more. The subsoil, to a depth of 3 feet or more, is dark brown or very dark brown sand or fine sand. It is strongly cemented by organic matter in most places but is only slightly cemented in some spots. Roots apparently are blocked by the strongly cemented subsoil, but water passes through the subsoil readily. The subsoil is underlain by loose sand that is commonly brown in the upper part but is lighter colored as depth increases.

In dry cultivated areas, the surface of these soils is almost white. The cemented hardpan is less than 20 inches from the surface in some places and may be only a few inches thick.

These soils are generally extremely acid, for few, if any, areas have been limed. Available moisture capacity is low, and plant nutrients are not retained well. Although these soils are easy to work, at times they are too wet to support heavy equipment. They remain wet until late in spring and require artificial drainage if they are cultivated. In places where the water table can be lowered, drainage is fairly easy and can be accomplished with field ditches if outlets are available. Tile probably would function well, but the cost of laying tile may be more than the return from crop yields.

These soils are little used for agriculture. Most of the acreage is wooded, but there is some unimproved pasture that provides limited grazing. Wetness limits the suitability of these soils as sites for buildings, and the high water table prohibits septic tanks from functioning.

The Leon soils are not so wet as the St. Johns soils or so black in the surface layer. In surface appearance Leon soils are similar to the Plummer and Klej soils, but Plummer and Klej soils do not have a hardpan. Leon soils are wetter than the Klej soils.

Leon loamy sand (Lo).—This is the only Leon soil mapped in the county. It is level or very gently sloping. Most of it is still wooded. Use for cultivated crops and improved pasture is limited by very low available moisture capacity and fertility, extreme acidity, poor drainage, and a hardpan that obstructs roots.

This soil is used mostly as woodland and has only limited use for grazing. Blueberries and other acid-tolerant crops grow fairly well. (Capability unit Vw–5; drainage group 9–2B; irrigation group 1; woodland group 10.)

Made Land

Made land (Ma) consists of areas in which the soil material has been disturbed and changed by earth-moving operations. It consists of fill material, generally oyster shells, or of areas where the soil material has been removed or mixed through land leveling.

This land is so varied that examination is needed on the site to determine suitability for specific uses. Most areas are used for industrial, commercial, and residential sites. (No capability unit; woodland group 21.)

Matapeake Series

The Matapeake series consists of deep, well-drained soils on uplands. These soils are mainly brown, and they have a strong-brown, silty, well-developed subsoil. The underlying material is loose and sandy. Most areas are level to gently sloping, but a few are strongly sloping. The native vegetation is mixed hardwoods, mostly oaks, and some loblolly pine.

The plow layer is generally olive-brown or dark yellowish-brown, slightly sticky silt loam or fine sandy loam. In wooded areas the surface layer is dark grayish brown and generally is only 2 to 4 inches thick. The subsurface layer is yellowish brown and extends to a depth of about 12 inches. In some places it has been completely mixed with the surface layer. The subsoil, to a depth of about 30 inches, is yellowish-brown to strong-brown silty clay loam that is sticky but somewhat crumbly. In most places there is a strong-brown lower subsoil that is up to 12 inches thick. It is somewhat sandier than the upper subsoil and is underlain by brownish-yellow, loose loamy sand or fine sand.

These soils are strongly acid or very strongly acid, except in many cultivated areas that have been limed for many years. They are easy to work, especially with

Figure 8.—**Harvesting Irish potatoes near Rehobeth on Matapeake fine sandy loam, 0 to 2 percent slopes.**

machinery, unless they are too wet or too dry. Because water moves through these soils rather readily, they are seldom wet for long periods. They usually warm up enough for planting fairly early in spring. The available moisture capacity is high.

In this county Matapeake soils are fairly extensive; they are among the soils most productive and most important agriculturally. Limitations to use are few. Although erosion is a hazard on the more strongly sloping soils, most of the acreage in Matapeake soils is level or gently sloping.

The Matapeake soils are similar to the Sassafras soils in color and in drainage. They are less sandy than the Sassafras and have more silt in the surface layer and subsoil. In texture Matapeake soils are somewhat similar to the moderately well drained Mattapex soils, the gray poorly drained Othello soils, and the black, very poorly drained Portsmouth soils.

Matapeake fine sandy loam, 0 to 2 percent slopes (MfA).—This soil has a profile like the one described for the Matapeake series. It is easy to work because its surface layer crumbles easily. Limitations to use are few. Figure 8 shows the harvesting of Irish potatoes on this soil. (Capability unit I–5; irrigation group 9; woodland group 7.)

Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded (MfB2).—This eroded soil has been cultivated for many years. In many cultivated areas that were not protected, much of the original surface soil has been washed away. In some plowed areas, part of the subsoil has been mixed into the original surface soil or into remnants of it. This soil, however, is still suitable for regular cultivation if practices are used to control further loss of soil through erosion. (Capability unit IIe–5; irrigation group 9; woodland group 7.)

Matapeake fine sandy loam, 5 to 10 percent slopes (MfC).—Most of this soil is still in trees, which have protected it from erosion. Slopes are strong enough, however, to limit the choice of crops. If this soil is cultivated regularly, conservation practices are needed to control erosion. (Capability unit IIIe–5; irrigation group 9; woodland group 8.)

Matapeake silt loam, 0 to 2 percent slopes (MkA).—This soil has a silty surface layer or plow layer that contains little sand or clay. It is probably the most important agricultural soil in the county. Use of this soil is practically unlimited, and production is high. (Capability unit I–4; irrigation group 13; woodland group 7.)

Matapeake silt loam, 2 to 5 percent slopes, moderately eroded (MkB2).—Most of this sticky eroded soil has been cultivated for many years, sometimes without good management or adequate protection. In a few, small, scattered areas so much of the surface layer has been washed away that normal plowing turns up a considerable amount of subsoil. These areas are strong brown and can be clearly seen in newly plowed areas. They are stickier and harder to work than the less eroded areas. If conservation practices are adequate, however, all of this soil can be cultivated regularly. Because this is one of the better agricultural soils in the county, it should be protected. (Capability unit IIe–4; irrigation group 13; woodland group 7.)

Matapeake silt loam, 5 to 10 percent slopes, moderately eroded (MkC2).—Most of this moderately eroded soil has been well managed, and some of it is still protected by trees. Continued careful management, including intensive conservation practices, is needed if this soil is cultivated regularly. (Capability unit IIIe–4; irrigation group 13; woodland group 8.)

Matapeake silt loam, 5 to 10 percent slopes, severely eroded (MkC3).—This severely eroded soil has lost most of its original surface layer. Its plow layer consists of material that was formerly subsoil and is stickier than the plow layer of Matapeake silt loam, 5 to 10 percent slopes, moderately eroded. A seedbed is more difficult to prepare than it is on the moderately eroded soil. Also, plant growth is slower, and crop yields are somewhat less. If this soil is used regularly for agriculture, careful management is needed to control further erosion. Cultivated crops shold be grown only occasionally, and a vegetative cover should protect the soil most of the time. (Capability unit IVe–3; irrigation group 13; woodland group 13.)

Matapeake silt loam, 10 to 15 percent slopes (MkD).—This soil is not appreciably eroded, because most of it is wooded or is protected by other permanent vegetation. If it is used for agriculture, this soil needs the same kind of management for protection against erosion as is needed on Matapeake silt loam, 5 to 10 percent slopes, severely eroded. (Capability unit IVe–3; irrigation group 13; woodland group 8.)

Mattapex Series

Soils of the Mattapex series occur on uplands and are moderately well drained. These soils are level to gently sloping and generally are in broad, smooth areas. They have a very silty, well-developed subsoil that is mottled or spotted in the lower part. This mottling indicates that internal drainage and aeration are not good. Although water moves through these soils rather readily, a water table is fairly close to the surface in wet periods. Mattapex soils are mostly silty, but they overlie sandier material. The native vegetation is mostly hardwoods that consist of many oaks and some sweetgum, red maple, and holly. Loblolly pine also occurs in some places.

The plow layer is silt loam or fine sandy loam that is dark brown in most places. Although it is slightly sticky, it crumbles readily. A subsurface layer extends to a depth of about 18 inches and is like the surface layer except that it is yellowish brown. In wooded areas the surface

layer is dark brown or dark grayish brown and is only 1 to 4 inches thick. The subsoil, to about 3 feet, is silty clay loam that generally is light yellowish brown. The lower part of the subsoil is more sticky than the upper part and is somewhat mottled or spotted. Beneath the subsoil in many places, there is a highly silty, mottled layer that is only slightly sticky and is underlain by sandy material. In other places the sandy material is directly beneath the subsoil.

The Mattapex soils are strongly acid or very strongly acid, except in some areas that have been heavily limed for years. These soils are easy to work if they are not too wet or too dry. They are fairly wet in winter and early in spring, however, and may be somewhat late in drying and warming enough for plowing and planting. The available moisture capacity is high.

The Mattapex soils are fairly extensive in Somerset County and are important agriculturally. They produce fairly high yields under good management, including artificial drainage for some crops. In some sloping areas use of these soils is somewhat limited by the hazard of erosion.

The Mattapex soils resemble the Keyport and the Woodstown soils in color and in drainage. They have a looser subsoil that contains less clay than that of the Keyport soils. The Mattapex soils are much more silty than the Woodstown soils.

Mattapex fine sandy loam, 0 to 2 percent slopes (MpA).—This soil is like the one described for the Mattapex series. It tends to be wet, especially at planting time and early in the growing season. If excess water is removed at this time, the soil is suitable for nearly all common crops and is highly productive. (Capability unit IIw–5; drainage group 2–A; irrigation group 9; woodland group 11.)

Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded (MpB2).—Most of this soil is sloping enough to have adequate surface drainage. The control of erosion is most important on this soil, for part of the surface layer has been lost in most places. If this soil is properly managed, however, it produces high yields of most crops. (Capability unit IIe–36; drainage group 2–A; irrigation group 9; woodland group 11.)

Mattapex silt loam, 0 to 2 percent slopes (MsA).—This is the most extensive Mattapex soil in the county and the most important agriculturally. Its plow layer is mostly silt and contains little sand or clay. Removal of excess water is needed early in spring if yields are to be high. (Capability unit IIw–1; drainage group 2–A; irrigation group 13; woodland group 11.)

Mattapex silt loam, 2 to 5 percent slopes, moderately eroded (MsB2).—On this soil, erosion is the most important management problem, but it can be controlled with ordinary conservation practices. Surface drainage is fairly good, but the internal drainage may need some improvement. Included in areas mapped are a few small areas that have slopes of more than 5 percent. (Capability unit IIe–16; drainage group 2–A; irrigation group 13; woodland group 11.)

Mixed Alluvial Land

Mixed alluvial land (Mx) is on bottom lands along some streams. It is frequently flooded, and most areas are poorly drained. Within short distances the surface layer ranges from sand or loamy sand to loam or silt loam. It is light gray or dark gray in most places but is black where a large amount of organic matter has accumulated.

This land is so varied in texture and commonly is so wet that it hardly ever is used for farming. Most areas are woodland, but they could be drained and developed into good pasture. (Capability unit VIw–1; drainage group 12; woodland group 2.)

Muck and Peat

Muck and peat (My) occur in fairly large disconnected areas along the Pocomoke River. These areas are also along parts of Dividing Creek. They consist of materials that range from deep, fairly dense deposits of well-decomposed muck to looser, more watery deposits of partly decomposed peat. Some areas are mixtures of these kinds of organic materials.

This land type is in dense stands of bay, gum, and other water-tolerant trees. It is little used, except for the small amount of timber that is removed and the excellent food and shelter that is supplied for some kinds of wildlife. (Capability unit VIIw–1; woodland group 21.)

Othello Series

The Othello series consists of poorly drained, gray, silty soils that have a mottled subsoil. Water moves through these soils fairly slowly, and for long periods the water table is at or near the surface. These soils are on upland flats in large areas of the western and southern parts of the county, particularly the southern. Some areas close to the Chesapeake Bay and tidal rivers are only slightly above sea level. The native vegetation is mostly hardwoods that include red maple, sweetgum, and many oaks. In places there are good stands of loblolly pine.

The plow layer, to a depth of about 10 inches, is dark gray or dark grayish brown. It is silt loam in most places but silty clay loam in some. In wooded areas the surface layer is only about 1 to 6 inches thick and is underlain by a thin, gray, silty subsurface layer that is finely mottled with yellowish brown in some places. The subsoil, to a depth of 26 to 30 inches, is gray or light-gray silty clay loam that is fairly sticky. It is prominently mottled with yellowish brown in most places. The subsoil is sandier below a depth of 26 inches than it is in the upper part. In some places grayish sand underlies the subsoil at a depth of 26 inches.

The Othello soils are very strongly acid or extremely acid unless they have been limed. They have high available moisture capacity and retain plant nutrients well. They can be worked only within a narrow range of moisture content and are quite wet in winter and spring. Planting is delayed unless the soils are artificially drained.

The Othello soils are limited in use chiefly by poor drainage and a seasonally high water table. Some sloping areas are moderately eroded, but generally erosion is not a serious problem. These soils are damaged by salt water in some places where tides are extremely high. They are severely limited as building sites and for septic tanks.

The Othello soils are the most extensive soils in the county; they occupy more than 66,000 acres. These soils are similar to the Fallsington soils in color and in drain-

Figure 9.—Peppers on Othello silt loam, 0 to 2 percent slopes. Artificial drainage is needed if cultivated crops are grown.

age but are less sandy and contain much more silt in the surface layer and subsoil.

Othello silt loam, 0 to 2 percent slopes (OhA).—This is the most typical soil of the Othello series and the most extensive soil in the county. Included in areas mapped are a few spots that are slightly sandy.

If this soil is adequately drained, it is suited to nearly all crops commonly grown. Much of the soil is cultivated, but large areas are still wooded. A typical cultivated field is shown in figure 9. (Capability unit IIIw–7; drainage group 8–1A; irrigation group 13; woodland group 10.)

Othello silt loam, 2 to 5 percent slopes, moderately eroded (OhB2).—This soil is sloping enough to have fairly good surface drainage, but internal drainage is poor. Drainage is the most important management problem. If runoff is not diverted into drainage channels, erosion causes further damage. Included in mapped areas are a few spots that have a fairly sandy surface layer. (Capability unit IIIw–7; drainage group 8–1A; irrigation group 13; woodland group 10.)

Figure 10.—Othello silt loam, low, that is flooded with brackish or salty water by an unusually high tide.

Othello silt loam, low (Om).—This soil is essentially the same as Othello silt loam, but it lies so close to sea level that occasionally it may be flooded at extremely high tides.

It remains wet for long periods and is difficult or almost impossible to drain in some places. Figure 10 shows tidal flooding, and figure 11 show a gate that has been installed to prevent flooding. Because salt water is likely to flood this soil, crops generally are not grown. Under good management, however, this soil does not deteriorate if it is used for grazing or as woodland. (Capability unit Vw–1; drainage group 10; woodland group 19.)

Othello silt loam, silty substratum (Oo).—In this soil the subsoil is directly underlain by silty material instead of by sand or sandy material, as is the subsoil of Othello silt loam, 0 to 2 percent slopes. If artificial drainage is adequate, corn, soybeans, and some pasture plants are grown. This soil is excellent for trees, particularly lob-

Figure 11.—Closing the floodgate helps control flooding on Othello silt loam, low, and other wet soils.

lolly pine. It is locally called white oak land. (Capability unit IIIw–7; drainage group 8–1A; irrigation group 13; woodland group 10.)

Othello silty clay loam (Os).—In this soil the surface layer is finer textured than that of Othello silt loam and is almost as fine and sticky as the subsoil. The plow layer is so hard to work at almost any content of moisture that normal cultivation of row crops is almost impossible. Also, this soil is difficult to drain. It is suited as woodland, however, and pasture can be developed. In some uncleared areas wet, depressional pockets are included that have a thicker and darker colored surface soil than normal. (Capability unit VIw–2; drainage group 8–2A; irrigation group 14; woodland group 10.)

Othello silty clay loam, silty substratum (Ot).—This soil is much the same as Othello silty clay loam, but it is underlain by silty deposits instead of by sand or sandy material, and it is slightly slower in drainage. Although this soil is not used for crops, it is good as woodland and is particularly well suited to loblolly pine. Also, reason-

ably good pasture can be developed. (Capability unit VIw-2; drainage group 8-2A; irrigation group 14; woodland group 10.)

Plummer Series

Soils of the Plummer series are poorly drained, grayish, and very sandy throughout. Water moves through them fairly rapidly, but the water table stands at or near the surface for long periods unless it has been lowered by drainage. These soils occur on level uplands or in slight depressions, mostly in the northeastern part of the county. The native vegetation is mostly red maple, silver maple, sweetgum, and other wetland hardwoods. Huckleberry grows in an undergrowth in places, and there are some loblolly pines and pond pines.

In wooded areas the surface layer is grayish-brown, loose loamy sand about 7 inches thick. The thin subsurface layer is much the same as the surface layer but is lighter colored. In cultivated areas the plow layer is normally grayish brown, but in dry areas that have been exposed for some time, it may be light gray to almost white. The subsoil, to a depth of about 4 feet, is light-gray or light olive-gray, loose loamy sand mottled with large spots of brown. A thick deposit of light gray, loose sand underlies the subsoil and is saturated during most of the year.

The Plummer soils are normally very strongly acid or extremely acid. They are very easy to work when they are dry enough to support farm equipment. These soils are wet in winter and may be wet fairly late in spring unless they have been artificially drained. Planting is sometimes delayed.

Use of Plummer soils is limited by poor drainage, by a high water table, by extreme acidity, by lack of plant nutrients, and in drained areas, by droughtiness during long hot summers. The available moisture capacity is low to very low. Because these soils do not retain plant nutrients well, large amounts of fertilizers commonly are needed.

The Plummer soils occur mostly with the Klej and the Leon soils. Like the Leon soils the Plummer soils are gray and wet, but they do not have a brown hardpan. They are more poorly drained than the Klej soils, which are also very sandy.

Plummer loamy sand (Pd).—Although water moves through this soil rapidly, it is difficult and rather expensive to drain in places, especially where outlets are not adequate. Drained areas are at times used for crops, including home gardens, mostly because they are easy to work. High yields are not expected. Included in mapped areas are spots that have a thicker and darker colored surface layer than that described for the Plummer series. (Capability unit IVw-6; drainage group 9-1A; irrigation group 1; woodland group 10.)

Pocomoke Series

The Pocomoke series consists of very poorly drained, wet soils that have a black surface layer and a mottled gray subsoil. These soils are moderately sandy and permit water to move through them fairly well, but the water table is at the surface for long periods. The Pocomoke soils are on upland flats, mostly in the northern and northeastern parts of the county. The native vegetation is mostly wetland hardwoods, including gum, red maple, silver maple, and various oaks. Pond pine and loblolly pine grow in places.

In wooded areas there is a black, crumbly loam or sandy loam surface layer 8 to 10 inches thick. In cultivated areas the plow layer may be very dark gray or very dark grayish brown instead of black. The subsoil, to a depth of about 28 inches, is gray or light gray, normally mottled or spotted with yellowish brown. It ranges from heavy sandy loam to sandy clay loam. Beneath the subsoil is gray, mottled, very sandy material that contains fine gravel in some places.

The Pocomoke soils are very strongly acid or extremely acid in their natural condition, but many cultivated areas have been limed. These soils are easy to work, except during the long periods when the water table is high and the soil is wet and cannot support heavy machines. Artificial drainage is needed before these soils can be cropped, but even after drainage, planting may be delayed because the soil is wet and cold. The available moisture capacity is moderate. Harvesting by machines should be completed before late in the season when the soils are very wet.

The crops most common on these soils are corn and soybeans, but there are some truck crops, forage crops, and pasture plants. These soils are severely limited in use by the very poor drainage and the seasonally high water table. Although available moisture capacity is moderate, crops benefit from supplemental irrigation in extremely dry years. Plant nutrients are retained fairly well, but large amounts of fertilizers are applied for some crops. Some areas require large amounts of lime. The Pocomoke soils are severely limited for either building sites or for sewage disposal by septic tanks.

The Pocomoke soils look like the Portsmouth soils on the surface; both kinds of soil are black and very wet. The Pocomoke soils, however, are not so difficult to drain where outlets are adequate, for their subsoil is coarser and less sticky than that of the Portsmouth soils. The Pocomoke soils occur in the same fields as the grayer Fallsington soils, which are not so wet as the Pocomoke.

Pocomoke loam (Pk).—This is the most extensive Pocomoke soil in the county. It can be drained by ditches or tile, but closer spacing is required than on the Pocomoke sandy loam, which is somewhat more porous and easier

Figure 12.—Soybeans on artificially drained Pocomoke sandy loam near Greenhill.

to drain. Pocomoke loam is well suited to farming, and is used for many crops and for trees. (Capability unit IIIw-7; drainage group 9-3A; irrigation group 13; woodland group 1.)

Pocomoke sandy loam (Pm).—This soil is like the one described for the Pocomoke series and has a crumbly sandy loam surface layer. If it is not too wet, it is easy to work. It is fairly easy to drain by tile or ditches where there are adequate outlets. This soil is not very extensive in Somerset County, but it is fairly important in agriculture (fig. 12). Of the very wet, black soils in the county, Pocomoke sandy loam is the easiest to drain and manage. Usually it is the earliest to be planted. (Capability unit IIIw-6; drainage group 9-3B; irrigation group 9; woodland group 1.)

Portsmouth Series

The Portsmouth series consists of wet, very poorly drained soils that normally have a black surface layer and a mottled or spotted gray subsoil. These soils are silty, particularly in the subsoil, and water moves through them slowly. For long periods the water table is at or above the soil surface. These soils are on upland flats or in slight depressions. They are widely distributed throughout the county. The native vegetation consists of wetland hardwoods, mostly red maple, gum, and various oaks, and there is some loblolly pine and pond pine.

In wooded areas the surface layer is black, crumbly loam or silt loam 8 to 12 inches thick. In cultivated fields the plow layer may be very dark gray or very dark brown instead of black because the organic-matter content has declined. The upper subsoil, to a depth of about 26 inches, is firm, sticky silty clay loam that is gray to light gray, commonly mottled or spotted with yellowish brown. The lower subsoil extends only to 30 or 32 inches and is somewhat sandy. Underlying the lower subsoil is grayish, very sandy material that contains some fine gravel.

The Portsmouth soils are generally very strongly acid or extremely acid, but some cultivated areas have been limed. The available moisture capacity is moderate or high. These soils are not difficult to work when the moisture content is favorable; but they are frequently too wet. When they are wet, they tend to clod and do not support heavy farm machines. The Portsmouth soils must be drained if they are cropped, but even if drained, they tend to be wet and cold in the spring. Harvesting should be completed before the soils become so wet that they cannot support machines.

The Portsmouth soils are severely limited in use by a seasonally high water table and very poor natural drainage. Plant nutrients are retained well, but most crops are heavily fertilized. Lime is commonly applied. The most common crops are soybeans and corn, but there are also some truck crops, forage crops, and pasture. These soils are severely limited as building sites or for septic tanks.

The Portsmouth soils are much like the Pocomoke soils in color and in natural drainage but are less sandy in the surface layer and subsoil. The Portsmouth soils have slower internal drainage than the Pocomoke soils and are more difficult to drain. Also, Portsmouth soils are not so easily managed and worked as the Pocomoke soils. The Portsmouth soils commonly occur with the grayer Othello soils, which are poorly drained and silty but are not so wet as the Portsmouth soils.

Portsmouth loam (Po).—The surface layer of this soil contains more sand than the surface layer of Portsmouth silt loam. Consequently, this soil is easier to work and generally supports farm machines better. Drained areas are good for farming, but this soil is not very extensive in Somerset County. (Capability unit IIIw-7; drainage group 9-4A; irrigation group 12; woodland group 1.)

Portsmouth silt loam (Pr).—The silty surface layer or plow layer of this soil is very silty and contains little sand or clay. It is somewhat mucky in many wooded areas. This soil is difficult to drain and to manage, and it does not support heavy machines well, particularly if it is wet. It produces good yields of many crops, however, if it is drained and managed well. Portsmouth silt loam is extensive in Somerset County and is potentially important to agriculture, but large areas are still wooded. (Capability unit IIIw-7; drainage group 9-4A; irrigation group 12; woodland group 1.)

St. Johns Series

The St. Johns series consists of very poorly drained, wet, sandy soils that have a black surface layer and a dark-brown, cemented subsoil commonly called a hardpan. These soils formed in sand on upland flats or in shallow depressions. They have a very high water table. The native vegetation is mostly red or swamp maple and pond pine, but there are other wetland hardwoods and some loblolly pine.

The surface layer, to a depth of 8 or 10 inches, is black, almost loose loamy sand containing grains of clean white sand. The subsurface layer, extending to a depth of 18 to 20 inches, is much like the surface layer except that it is dark gray instead of black. The upper subsoil, to a depth of 24 inches or more, is dark reddish-brown loamy sand or fine sand. It is strongly cemented with organic matter in most places, but in some small areas it is soft or only slightly cemented. Apparently, roots do not penetrate the upper subsoil where is it hard, but water passes through it readily. The lower subsoil consists of dark-brown sand or fine sand and is not cemented. It is underlain by loose fine sand that is a paler brown as depth increases.

Particularly in wooded areas, the surface layer is almost mucky in some places. In some small areas the cemented upper subsoil is much more than 6 inches thick.

The St. Johns soils are extremely acid in most places; few, if any, areas have been limed. These soils are easy to work, but in most places they are so wet that they do not support farm machines. Unless they are drained, they are wet until late in spring. In places water is ponded on these soils. Although these soils are wet, the available moisture capacity is low or very low.

These soils are little used for agriculture. If they are cultivated, artificial drainage is needed. Although water passes through them readily, these soils are difficult to drain in many places because suitable outlets are missing. In addition, plant nutrients are not retained well. Consequently, management must be especially good if production is to be even moderate. The high water table severely limits the use of these soils as building sites or for septic tanks.

St. Johns soils are more poorly drained than the Leon soils, but both kinds of soils have a hardpan in the subsoil. The St. Johns soils are much sandier than the Pocomoke and the Portsmouth soils but, like those soils, are very dark colored and very poorly drained.

St. Johns loamy sand (Sa).—Most of this soil is still wooded. It is little used for farming, but blueberries are well adapted. Included in mapped areas near Wellington are some small areas in which tough, heavy clay instead of sand immediately underlies the hardpan. (Capability unit Vw–5; drainage group 9–2B; irrigation group 1; woodland group 10.)

Sassafras Series

Soils of the Sassafras series occur on uplands and are deep, well drained, and moderately sandy. They are dominantly brown and have a well-developed subsoil through which water moves readily. The Sassafras soils overlie loose sandy material. Most areas are smooth and level to gently sloping, but some areas are strongly sloping. The native vegetation is generally hardwoods, mostly oaks, but loblolly pine or Virginia pine grows locally.

The plow layer, to a depth of 10 or 12 inches, is a dark grayish-brown light sandy loam that crumbles readily. In wooded areas the dark grayish-brown surface layer is no more than 4 inches thick in most places. A yellowish-brown subsurface layer extends to a depth of about 18 inches and is much the same as the surface layer except for its color. The subsoil, to a depth of about 32 inches, is heavy sandy loam or light sandy clay loam. It is stickier than the surface layer and is yellowish brown to dark yellowish brown. Pale-brown, loose loamy sand underlies the subsoil.

The Sassafras soils are strongly acid or very strongly acid unless they have been limed. They are easy to work and are seldom wet for very long periods. These soils warm up so quickly in spring that they can be planted to most crops suitable for early planting. The available moisture capacity is moderate.

The Sassafras soils produce economic yields under good management, though available moisture capacity is only moderate. Management may include supplemental irrigation in unusually dry cropping seasons. Erosion, particularly on strong slopes, is the main limitation on these soils. Except in strongly sloping areas, problems are few if these soils are used as building sites or for sewage disposal by septic tanks.

The Sassafras soils are similar to the Downer and the Matapeake soils in color and in drainage. They have a much less sandy surface layer than the Downer soils and a thinner, less sandy subsoil. They are much less silty throughout than the Matapeake soils. In texture Sassafras soils are somewhat similar to the moderately well drained Woodstown soils, the somewhat poorly drained Dragston soils, the grayish, poorly drained Fallsington soils, and the very dark, very poorly drained Pocomoke soils.

Sassafras sandy loam, 0 to 2 percent slopes (SfA).—This soil is like the soil described as representative of the Sassafras series. It is one of the better agricultural soils of the county and is mostly used for truck crops, corn, and soybeans. Limitations to use for common crops, or for most nonagricultural purposes, are few. Yields are most favorable if fertility is kept at a high level and supplemental irrigation is used when needed. (Capability unit I–5; irrigation group 9; woodland group 7.)

Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded (SfB2).—This soil has lost a part of its original surface soil in most places, but further soil losses can be prevented by ordinary conservation practices. If these practices are used, this soil can be safely kept in regular cultivation. (Capability unit IIe–5; irrigation group 9; woodland group 7.)

Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded (SfC2).—Most of this soil has lost much of its original surface layer. Because slopes are stronger than those of Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded, more intensive management, including erosion control, is needed to prevent excessive loss of soil, and to keep this soil in continued cultivation. (Capability unit IIIe–5; irrigation group 9; woodland group 8.)

Sassafras sandy loam, 5 to 10 percent slopes, severely eroded (SfC3).—This soil has lost so much of its original surface layer that plowing to normal depth turns up some of the subsoil. The subsoil is exposed in some places, and there are some gullies. The present plow layer is browner, stickier, and more difficult to manage than the original surface layer, but careful management, including intensive erosion control, keeps this soil so that it can be used continuously for agriculture. (Capability unit IVe–5; irrigation group 9; woodland group 13.)

Sassafras sandy loam, 10 to 15 percent slopes (SfD).—This soil is steeper than the other Sassafras sandy loams in the county and, if cultivated, is much more likely to be damaged by erosion. Little erosion has occurred because most areas remain wooded. Because of the erosion hazard, cropping is severely limited and special practices are needed to control erosion. (Capability unit IVe–5; irrigation group 9; woodland group 8.)

Steep Sandy Land

Steep sandy land (St) occurs mainly in the higher and better drained parts of the county. It occurs as steep narrow strips that are mostly on the sides of draws or ravines but are also on bluffs adjacent to the larger rivers. Although the soil material of this land varies considerably, areas are short and steep, generally sandy, moderately well drained to excessively drained, and so susceptible to erosion that they cannot be cultivated without special management.

Because of the extreme danger of erosion, this land generally is not suitable for cultivation. All cleared areas should be kept in permanent vegetation of some kind. Grazing is a suitable use in most areas if it is carefully controlled, but areas still in trees should remain so. (Capability unit VIe–2; woodland group 9.)

Swamp

Swamp (Sw) is in fairly large areas where fresh water stands most, if not all, of the time. Its cover is water-tolerant hardwoods and a few pond pines. The soil material consists of sand, silt, clay, muck, or mixtures of these.

Swamp cannot be used for crops, though some areas may produce timber or, in especially dry seasons, provide

Figure 13.—**A typical area of Tidal marsh along Marumsco Road near where it crosses Marumsco Creek.**

browse for livestock. Generally, the only other use is providing food and cover for some kinds of wildlife. (Capability unit VIIw–1; woodland group 21.)

Tidal Marsh

Tidal marsh (Tm) is extensive in the western and southern parts of this county. It borders the estuaries of the Wicomico, Manokin, and Big Annemessex Rivers and the Pocomoke Sound. In smaller areas it is adjacent to the salt waters of the Chesapeake Bay and its tidal tributaries (fig. 13). Also, many of the islands, particularly Smith Island, South Marsh Island, and James Island, are mostly marsh areas.

The characteristics of the soil material in these marshes vary widely. Some areas are salty or brackish, and many areas, particularly clayey ones, have large concentrations of sulfur compounds. Tidal marsh is not used for crops or pasture, though salt-grass hay was once harvested in some areas. (Capability unit VIIIw–1; woodland group 21.)

Woodstown Series

The Woodstown series consists of moderately well drained soils that occur in uplands that are level to gently sloping and, in most places, smooth. These soils are mostly yellowish brown to olive brown. They have a well-developed subsoil through which water moves rather readily, though the lower part of the subsoil is mottled or spotted. The water table is fairly close to the surface in wet periods. The predominant native vegetation is mixed hardwoods, mostly oak, but generally there are some red maples, holly, sweetgum, or other trees. Some areas have a considerable number of loblolly pines.

The plow layer, to a depth of about 10 inches, is dark grayish brown in most places. It is loam or sandy loam that crumbles readily, though it is slightly sticky. In wooded areas the surface layer is dark gray and is only 2 or 3 inches thick in most places. The subsurface layer is much like the surface layer except for its yellowish-brown color. In many plowed areas the surface and subsurface layers have been completely mixed. The upper subsoil, extending to a depth of about 24 inches, is light olive-brown or yellowish-brown heavy sandy loam or sandy clay loam that is mottled or spotted in the lower part. The grayish lower subsoil has many yellowish-brown mottles. It extends to about 36 inches and is sandier than the upper subsoil. Underlying the lower subsoil is yellowish-brown, loose loamy sand that is mottled or streaked with grayish colors.

In some places a finer textured layer occurs at a depth of 5 feet or more and probably accounts for the impeded drainage of these soils.

The Woodstown soils are strongly acid to extremely acid in areas that have not been limed. They are easy to work but may be wet so late in spring that planting is delayed. Available moisture capacity is moderate.

The Woodstown soils are not extensive in Somerset County but are important locally. Artificial drainage is required, particularly for some crops, if yields are to be favorable. Practices to control erosion are needed in sloping areas. Seasonal wetness somewhat limits the use of these soils as building sites, and septic tanks do not function properly during the wetter parts of the year.

The Woodstown soils are similar to the Mattapex and the Keyport soils in natural drainage and in color, but they are much less silty and more sandy than the Mattapex soils and do not have a tight, clayey subsoil like that in the Keyport soils. Soils that are somewhat similar to the Woodstown soils in texture are the well-drained Sassafras soils, the somewhat poorly drained Dragston soils, the gray, poorly drained Fallsington soils, and the very dark, poorly drained Pocomoke soils.

Woodstown loam, 0 to 2 percent slopes (WdA).—This soil has a loam surface layer and is like the soil described for the Woodstown series. If drainage is improved, this soil is suited to most crops commonly grown in the county. It can be drained by ditches or tile lines. (Capability unit IIw–1; drainage group 2–A; irrigation group 13; woodland group 3.)

Woodstown loam, 2 to 5 percent slopes, moderately eroded (WdB2).—This gently sloping soil has lost part of its original surface layer through erosion. Controlling erosion is the dominant management problems, though improving internal drainage is also important. Practices to control erosion should check or reduce surface runoff. (Capability unit IIe–16; drainage group 2–A; irrigation group 13; woodland group 3.)

Woodstown sandy loam, 0 to 2 percent slopes (WoA).—This soil is normally easier to drain, to work, and to manage than the Woodstown loam, 0 to 2 percent slopes, and fortunately is more extensive in Somerset County. Properly drained areas are suitable for cultivation (Capability unit IIw–5; drainage group 2–B; irrigation group 9; woodland group 3.)

Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded (WoB2).—On most of this soil, erosion is a greater hazard than the impeded drainage. Part of the original surface has been lost through erosion in most places, but erosion can be checked by ordinary practices of erosion control. For some uses, artifical drainage is needed. (Capability unit IIe–36; drainage group 2–B; irrigation group 9; woodland group 3.)

Use and Management of the Soils

The soils of Somerset County are used for crops, trees, and pasture. This section explains how the soils can be used for those purposes and also for providing wildlife habitats; for building highways, farm ponds, and other engineering structures; and for urban, suburban, and other nonfarm purposes. The section also gives estimated yields for principal crops grown under two levels of management. In presenting information concerning cultivation, the soils that require similar management are grouped, the groups are described, and the management suitable for them is suggested. Also, general practices of management are discussed. In addition to the grouping of soils for crops and pasture, soils are grouped in this section according to their suitability for trees, drainage, and irrigation.

About 64 percent of the land area of Somerset County, or nearly 136,000 acres, is suitable for cultivation, but in 1960 crops were harvested from less than 35,000 acres. About 10 percent of the county, though not generally used for crops, can produce timber and pasture and forage for livestock. The remaining 26 percent of the county consists of salt marshes and beaches that are not suitable for agriculture.

Only about 3 percent of the land area can be used for agriculture without artificial drainage or other special management. Of the remaining 61 percent suitable for cultivation, artificial drainage is needed on 54 percent, erosion control on 6 percent, and irrigation or practices to raise fertility on 1 percent.

Artificial drainage, therefore, is the greatest need. Of the acreage that needs drainage, about one-sixth needs only simple drainage measures, generally the removal of surface water during wet periods. But five-sixths, or about 100,000 acres, is very wet much of the time and requires intensive drainage practices if it is to be productive.

Capability Groups of Soils

The capability classification is a grouping that shows, in a general way, how suitable soils are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soil are grouped at three levels, the capability class, subclass, and unit. The eight capability classes in the broadest grouping are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so sandy, salty, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes there can be up to four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil will interfere with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the country, indicates that the chief limitation is climate that is too cold or too dry. There are no soils of subclass *c* in Somerset County.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils in it are subject to little or no risk of erosion but have other limitations that restrict their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are the capability units, which are groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally identified by numbers assigned locally, for example, IIe-4 or IIIe-5.

Soils are classified in capability classes, subclasses, and units in accordance with the degree and kind of their permanent limitations; but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil; and without consideration of possible but unlikely major reclamation projects.

Somerset County has approximately 6,076 acres of class I soils; 26,405 acres of class II soils; 102,811 acres of class III soils; 795 acres of class IV soils; 1,857 acres of class V soils; 13,250 acres of class VI soils; 5,623 acres of class VII soils; and 56,097 acres of class VIII soils.

The soils of Somerset County have been grouped into the following classes, subclasses, and capability units. The numbering of the capability units is not consecutive because a statewide system is used in Maryland, and some of the capability units are not represented in the county.

Class I. Soils that have few limitations that restrict their use.
- (No subclasses)
  - Capability unit I-4. Deep, well-drained, medium-textured, nearly level soils on uplands.
  - Capability unit I-5. Deep, well-drained, moderately coarse textured, nearly level soils on uplands.

Class II. Soils that have some limitations that reduce the choice of plants or require moderate conservation practices.
- Subclass IIe. Soils subject to moderate erosion if they are not protected.
  - Capability unit IIe-4. Deep, well-drained, medium-textured, gently sloping soils on uplands.
  - Capability unit IIe-5. Deep, well-drained, moderately coarse textured, gently sloping soils on uplands.
  - Capability unit IIe-16. Moderately well drained, medium-textured, gently sloping soils on uplands.
  - Capability unit IIe-36. Moderately coarse textured, gently sloping soils that occur on uplands and have somewhat impeded drainage.

Subclass IIw. Soils that have moderate limitations because of excess water.

Capability unit IIw–1. Nearly level or very gently sloping, medium-textured soils that occur on uplands and have impeded drainage.

Capability unit IIw–5. Nearly level, moderately coarse textured soils that occur on uplands and have impeded drainage.

Capability unit IIw–8. Moderately well drained, nearly level, medium-textured soils that have a slowly or very slowly permeable subsoil.

Capability unit IIw–9. Moderately well drained, nearly level, moderately coarse textured soils that have a slowly or very slowly permeable, fine-textured subsoil.

Subclass IIs. Soils that have moderate limitations of moisture capacity or tilth.

Capability unit IIs–4. Deep, well-drained, nearly level to gently sloping soils that have a coarse-textured surface layer and a finer textured subsoil.

Class III. Soils that have severe limitations that reduce the choice of plants, or require special conservation practices, or both.

Subclass IIIe. Soils subject to severe erosion if they they are cultivated and not protected.

Capability unit IIIe–4. Deep, well-drained, sloping to somewhat rolling, medium-textured soils.

Capability unit IIIe–5. Deep, well-drained, sloping to somewhat rolling, moderately coarse textured soils.

Capability unit IIIe–33. Deep, well-drained, sloping to somewhat rolling soils that have a coarse-textured surface layer and a finer textured subsoil.

Subclass IIIw. Soils that have severe limitations because of excess water.

Capability unit IIIw–6. Poorly drained and very poorly drained, moderately coarse textured, nearly level soils that have a moderately permeable subsoil.

Capability unit IIIw–7. Poorly drained and very poorly drained soils that have a medium-textured surface layer and a moderately to moderately slowly permeable, finer textured subsoil.

Capability unit IIIw–10. Moderately well drained and somewhat poorly drained, coarse-textured soils that have a rapidly permeable subsoil.

Subclass IIIs. Soils that have severe limitations of moisture capacity or tilth.

Capability unit IIIs–1. Deep, somewhat excessively drained, nearly level to moderately sloping soils that are coarse textured and rapidly permeable.

Class IV. Soils that have very severe limitations that restrict the choice of plants, or require very careful management, or both.

Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.

Capability unit IVe–3. Deep, well-drained, moderately sloping to strongly sloping, medium-textured soils.

Capability unit IVe–5. Deep, well-drained, moderately sloping to strongly sloping soils that are coarse textured and moderately coarse textured.

Subclass IVw. Soils that have very severe limitations for cultivation because of excess water.

Capability unit IVw–6. Coarse-textured, rapidly permeable soils that have a high water table and are poorly drained.

Class V. Soils not likely to erode that have other limitations, impractical to remove without major reclamation, that limit their use largely to pasture, woodland, or wildlife food and cover.

Subclass Vw. Soils too wet for cultivation; drainage or protection not feasible.

Capability unit Vw–1. Poorly drained, medium-textured soils that have a slowly or very slowly permeable subsoil and are subject to occasional flooding by high tides.

Capability unit Vw–5. Poorly drained and very poorly drained, extremely acid, coarse-textured soils that have an organic hardpan and a high or very high water table.

Class VI. Soils that have severe limitations that make them generally unsuitable for cultivation and that limit their use largely to pasture, woodland, or wildlife food and cover.

Subclass VIe. Soils severely limited, chiefly by risk of erosion if protective cover is not maintained.

Capability unit VIe–2. Moderately well drained and well drained, steep soils.

Subclass VIw. Soils severely limited by excess water and generally unsuitable for cultivation.

Capability unit VIw–1. Nearly level soils on flood plains that are frequently flooded and consist of varied materials that may change with each flood.

Capability unit VIw–2. Poorly drained, very slowly permeable, nearly level soils that have a hard and tough or sticky and plastic surface layer.

Class VII. Soils that have very severe limitations that make them unsuitable for cultivation without major reclamation and that restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIw. Soils very severely limited by excess water.

Capability unit VIIw–1. Organic land types that are so wet that draining and use for crops or pasture are impractical.

Subclass VIIs. Soils very severely limited by moisture capacity and an extreme hazard of droughtiness.

Capability unit VIIs–1. Deep, coarse textured and moderately coarse textured, nearly level to moderately sloping soils that are droughty.

Class VIII. Soils and landforms that, without major reclamation, have limitations that preclude their use for

commercial production of plants and that restrict their use to recreation, wildlife, water supply, or esthetic purposes.

Subclass VIIIw. Extremely wet or marshy land.

Capability unit VIIIw-1. Tidal marsh that is flooded regularly by salt water.

Subclass VIIIs. Rock or soil materials that have little potential for production of vegetation.

Capability unit VIIIs-2. Coastal beach; almost bare, noncoherent, loose sand.

Capability unit VIIIs-4. Land where soil has been removed.

Management by capability units

In the following pages each capability unit in the county is described briefly, the soils and land types in each are listed, and some suggestions for use and management are given. The soils and land types in a capability unit have similar characteristics and uses, and they require similar management.

Made land has not been placed in a capability unit, because it probably will not be used for agricultural purposes. In Somerset County Made land consists of hydraulic fill, most of it near Crisfield. From place to place it varies in suitability for specified uses. Areas of Made land are generally the sites for industrial and residential buildings, airports, golf courses, and similar facilities.

CAPABILITY UNIT I-4

Only Matapeake silt loam, 0 to 2 percent slopes (MkA), is in this capability unit. This soil is deep and well drained, and it has a silt loam surface layer and a moderately permeable subsoil. It occurs in nearly level upland areas that have little or no erosion.

This soil is most common in two areas of the county: (1) along the Manokin River from Goose Point to a point above Princess Anne and along Kings Creek almost to Peggy Boston Swamp, including the Stewart Neck area; and (2) along the Pocomoke River from a point below Rehobeth upstream to Costen Branch. The total area is about 4,629 acres, or 2.2 percent of the county.

This soil is probably the best one in the county for general farming, and it is suitable for intensive cultivation. It retains moisture and plant nutrients well and is fairly easy to work. A large total area is used for soybeans and corn, and a smaller acreage is used for small grain, vegetables, hay, and pasture. This soil is excellent for strawberries and for orchards. Crop rotations may be short or long. For favorable yields it is necessary to maintain fertility and add lime if needed and to maintain a leguminous cover or use a green-manure crop. Supplemental irrigation is beneficial in dry periods.

CAPABILITY UNIT I-5

The soils of this unit are deep and well drained, like the soil of capability unit I-4, but they have a sandier surface layer and are somewhat easier to work. The soils are—

(MfA) Matapeake fine sandy loam, 0 to 2 percent slopes.
(SfA) Sassafras sandy loam, 0 to 2 percent slopes.

These soils occur mostly in small disconnected areas in the northwestern part of the county. These areas extend from Deal Island along the south bank of the Wicomico River and Wicomico Creek almost to U.S. Highway No. 13. The soils in this unit account for about 1,477 acres, or about 0.7 percent of the county.

These friable soils can be cultivated intensively for long periods if good farming practices are used. In this county these soils are especially valued for truck crops. Because they are somewhat sandier than the soil in capability unit I-4, they are somewhat easier to work, but they do not hold moisture and plant nutrients quite so well. Yields of most crops should be almost as good as those on the soil in capability unit I-4 if good fertility is maintained and supplemental irrigation is used as required. Yields of some kinds of truck crops may even be better.

CAPABILITY UNIT IIe-4

Matapeake silt loam, 2 to 5 percent slopes, moderately eroded (MkB2), is the only soil in this capability unit. It is similar to the soil in capability unit I-4 but is more sloping and, therefore, subject to further erosion. Erosion has been active in many areas but has been severe in only a few small spots.

Most of this soil occurs adjacent to the Manokin River, Kings Creek, and the Pocomoke River, and in the Stewart Neck area. This soil occupies about 3,174 acres in this county, or about 1.5 percent of the area.

This soil is suited to crops common in the county but needs protection against erosion if use is to be safe and continuous. Needed for this protection are contour tillage, stripcropping, and a rotation that lasts at least 3 years and includes hay or other close-growing crops. Diversions that have well-sodded waterways may be needed for safe disposal of runoff water. In other respects, this soil has the same uses and management requirements as the soil of capability unit I-4.

CAPABILITY UNIT IIe-5

This capability unit consists of gently sloping, well-drained soils that are similar to the soils in capability unit I-5 but are more sloping and more eroded. The soils are—

(MfB2) Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded.
(SfB2) Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded.

These soils occur mostly along Wicomico Creek and the Wicomico River. They occupy about 5,162 acres, or about 2.5 percent of the county.

These soils are managed much like the soils of unit I-5 except that contour tillage, rotations that last at least 3 years, and careful disposal of runoff water are needed to combat erosion. The soils are used for all crops commonly grown in the county, particularly truck crops. Although these soils are somewhat easier to work and cultivate than the soil of capability unit IIe-4, they have somewhat lower capacities for holding moisture and plant nutrients. Yields should be about the same, however, if good fertility is maintained. Supplemental irrigation is desirable in long dry periods.

CAPABILITY UNIT IIe-16

This capability unit consists of gently sloping, moderately well drained soils that have a loam or silt loam surface layer and somewhat restricted aeration and drain-

age in the subsoil. The water table is high for at least part of the year. The soils are—

(FgB) Fallsington and Dragston loams, 2 to 5 percent slopes (Dragston soil only).
(MsB2) Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.
(WdB2) Woodstown loam, 2 to 5 percent slopes, moderately eroded.

These soils are in scattered areas, mostly in the northern and northwestern parts of the country. They total about 2,097 acres, or about 0.9 percent of the country.

Because drainage is somewhat impeded in the subsoil, runoff is accelerated. Some soil has been lost through erosion, but in most places the loss is not severe. In spring, planting may be delayed because these soils are slightly wet and cold. Tiling improves internal drainage, and properly spaced diversions reduce erosion by intercepting runoff and harmlessly disposing of it. These soils are suitable for most crops if drainage is improved, but alfalfa and similar crops may be damaged by winterheave. These soils need maintenance of fertility and probably some liming.

CAPABILITY UNIT IIe-36

This capability unit consists of gently sloping soils that have somewhat impeded drainage and, except for their sandier surface layer, are much like the soils of capability unit IIe–16. Because they are sandier, they are easier to work and to drain. The soils are—

(FdB) Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes (Dragston soil only).
(MpB2) Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded.
(WoB2) Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.

These soils are in scattered areas, mostly in the northern part of the county. They total about 2,018 acres, or about 0.9 percent of the county.

The soils in this unit are suited to most crops, but not to alfalfa. Wetness may delay planting in spring. Vegetables that mature late are well adapted to these soils, but those that mature early are not. These soils generally dry out more quickly than the soils of capability unit IIe–16. Erosion, as a rule, is more of a problem than impeded drainage, though drainage may be needed. Water can be removed by tiling the subsoil, and excess runoff can be intercepted and diverted. Unless fertility is especially well maintained, these soils may produce somewhat lower yields than more silty soils.

CAPABILITY UNIT IIw-1

The soils in this capability unit are similar to those in capability unit IIe–16, but they are nearly level or very gently sloping. They are—

(FgA) Fallsington and Dragston loams, 0 to 2 percent slopes (Dragston soil only).
(MsA) Mattapex silt loam, 0 to 2 percent slopes.
(WdA) Woodstown loam, 0 to 2 percent slopes.

These soils occur in scattered areas adjacent to the Wicomico, Pocomoke, and Manokin Rivers, on Stewart Neck, and in other places, mostly in the northern part of the county. They total about 8,519 acres, or about 4.0 percent of the county.

Because these soils are nearly level, excess water, particularly during spring, is a more important problem than the threat of erosion. The soils are suited to most crops commonly grown in the county, but alfalfa and similar crops are damaged by winterheave when there is much frost action. Spring plowing is generally delayed on these soils. The excess water can be carried away by tile lines or open ditches that are properly spaced, installed, and maintained. Ditches should never be so deep that they penetrate into the sandy substratum, because the sand tends to cave and to clog the ditches. Also, the sand may damage other areas if it is washed away and deposited on them. Fertility should be maintained, and some liming generally is needed.

CAPABILITY UNIT IIw-5

Except for their sandier surface layer, the soils in this capability unit are similar to those in capability unit IIw–1. They are more nearly level than the soils in unit IIe–36, but are similar to those soils in other respects. The soils are—

(FdA) Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes (Dragston soil only).
(MpA) Mattapex fine sandy loam, 0 to 2 percent slopes.
(WoA) Woodstown sandy loam, 0 to 2 percent slopes.

These soils are in scattered areas, mostly in the northern and northeastern parts of the county. They occupy about 3,758 acres, or about 1.7 percent of the county.

These soils are used and managed in much the same way as the soils of capability unit IIw–1, but they can be worked and drained more easily because they are sandier throughout, especially in the surface layer. Yields, however, are somewhat lower unless fertility is maintained. Drainage is the primary problem. If ditches are dug into the sandy substratum, their sides are likely to cave in.

CAPABILITY UNIT IIw-8

Keyport silt loam, 0 to 2 percent slopes (KmA), is the only soil in this capability unit. This silty soil has a slowly or very slowly permeable subsoil and is moderately well drained.

The total acreage of this soil is only about 303 acres, or slightly more than 0.1 percent of the county.

Water infiltrates into this soil slowly and drains through it very slowly. The surface layer in cultivated fields tends to pack after heavy rains and can be worked easily only within a narrow range of moisture content. The primary problem is drainage. In most places V-type ditches that are properly spaced and maintained are adequate. Because the subsoil is fine textured, tile is not very suitable for drainage. If drainage and management are good, however, and care is taken to cultivate only when the moisture content is favorable, this soil produces moderate or high yields of most crops common in the area. If crops, especially alfalfa, are kept on this soil through winter, they are damaged by soil heaving.

CAPABILITY UNIT IIw-9

Keyport fine sandy loam, 0 to 2 percent slopes (KfA), is the only soil in this capability unit. Except that the surface layer is fine sandy loam, this soil is like the soil in capability unit IIw–8, is nearly level, is moderately well drained, and has a slowly or very slowly permeable, fine-textured subsoil.

This soil occupies only about 190 acres, or slightly less than 0.1 percent of the county.

Water infiltrates the sandy surface of this soil a little more readily than it does the surface of the soil in capability unit IIw–8. Also, this soil is somewhat easier to drain and can be worked within a slightly wider range of moisture content. Because warming is a little more quick in the spring, planting is not so seriously delayed. This soil is used for most crops, but it is not well suited to alfalfa or other crops kept on the soil through winter.

CAPABILITY UNIT IIs–4

This capability unit consists of level to gently sloping, well-drained soils that have a friable loamy sand surface layer that is about 16 to 24 inches thick in most places. The subsoil is light sandy clay loam about 6 to 12 inches thick. It is underlain by a very sandy substratum. The soils are—

(DoA) Downer loamy sand, 0 to 2 percent slopes.
(DoB) Downer loamy sand, 2 to 5 percent slopes.

These soils occur at high elevations in the northern part of the county, especially near the Wicomico River. They total about 1,184 acres, or about 0.6 percent of the county.

The content of plant nutrients and of organic matter is fairly small in these soils, and the capacity to store and supply moisture is low. The primary management needs are maintaining sufficient moisture and fertility. Dry, unprotected areas of these soils are especially subject to wind erosion. Supplemental irrigation is always desirable and is sometimes necessary for favorable yields. Yields are generally favorable if management, including maintenance of fertility, is good. These soils are well suited to most crops and are most commonly used for truck crops, including sweetpotatoes.

CAPABILITY UNIT IIIe–4

The only soil in this capability unit is Matapeake silt loam, 5 to 10 percent slopes, moderately eroded (MkC2). This soil is deep and well drained. Because slopes are strong, use is severely limited by the hazard of erosion.

This soil is in scattered areas that total only about 106 acres, or less than 0.1 percent of the county.

This soil is suited to about the same kinds of crops as the soil in capability unit IIe–4, but it cannot be used so frequently for row crops without increasing the hazard of erosion. Needed on this soil are rotations at least 4 years long in which hay or another close-growing crop is grown much of the time. Soil losses are reduced if crops are grown in strips on the contour that have between them strips of permanent vegetation. Well-protected waterways are used to dispose of excess surface water. Generally, these waterways are in sodded strips.

CAPABILITY UNIT IIIe–5

This capability unit consists of well-drained soils that have their use for crops severely limited by the hazard of erosion. The soils are—

(MfC) Matapeake fine sandy loam, 5 to 10 percent slopes.
(SfC2) Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded.

These soils occupy only about 293 acres, or about 0.1 percent of the county.

The soils of this unit have stronger slopes than the soils of capability unit IIe–5 but are similar in other respects. They cannot be cultivated safely unless fairly intensive practices are used to control erosion. Compared with the soil in capability unit IIIe–4, these soils have a sandier surface layer, can be worked more easily, and have lower natural fertility. Fertility needs to be maintained at a high level if yields are to be favorable.

CAPABILITY UNIT IIIe–33

Downer loamy sand, 5 to 10 percent slopes (DoC), is the only soil in this capability unit. It has a thick surface layer and is deep and well drained. This soil is somewhat like the soils in capability unit IIs–4, but it is more sloping and more severely limited by erosion and other hazards.

Only about 113 acres of this soil are in the county.

Active soil erosion is caused mostly by water, but locally wind erosion also occurs. Erosion losses can be reduced by practicing contour cultivation, including stripcropping, and by lengthening crop rotations. This sandy soil needs maintenance of fertility and sufficient moisture if yields are to be consistently favorable. Large applications of fertilizer and supplemental irrigation are always desirable and, in especially dry periods, irrigation is necessary. This soil is suited to most crops grown in the county.

CAPABILITY UNIT IIIw–6

This capability unit is important because it consists of soils amounting to 7.5 percent of the county. These soils are poorly drained and very poorly drained. They have a sandy loam or fine sandy loam surface layer and a sandy clay loam, moderately permeable subsoil. Most of these soils are nearly level, but in some places slopes are as much as 5 percent. The soils are—

(Fb) Fallsington sandy loam.
(FdA) Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes (Fallsington soil only).
(FdB) Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes (Fallsington soil only).
(Pm) Pocomoke sandy loam.

These soils occur mostly in the northern and northeastern parts of the county, but small areas are scattered throughout. They occupy about 15,818 acres.

The surface layer of the Fallsington and Dragston soils is gray, and that of the Pocomoke soil is black and high in organic-matter content. Because drainage is poor or very poor, the soils in this unit have only limited use for some crops. Adequate drainage is required for normal crop production. These soils are well suited to tiling, but open ditches are difficult to maintain because their sides are likely to cave. If drainage, fertilization, and liming are adequate, favorable crop yields can be produced. Alfalfa and lespedeza, however, are not well adapted, and only a small acreage of small grain is grown. The woodland is good in many areas.

CAPABILITY UNIT IIIw–7

This capability unit consists of poorly drained and very poorly drained soils that have a loam or silt loam surface layer and a finer textured subsoil that is moderate to moderately slow in permeability. These soils are much like

the soils of capability unit IIIw–6 but are less sandy throughout, particularly in the surface layer. The soils are—

(Fa) Fallsington loam.
(FgA) Fallsington and Dragston loams, 0 to 2 percent slopes (Fallsington soil only).
(FgB) Fallsington and Dragston loams, 2 to 5 percent slopes (Fallsington soil only).
(Jo) Johnston loam.
(OhA) Othello silt loam, 0 to 2 percent slopes.
(OhB2) Othello silt loam, 2 to 5 percent slopes, moderately eroded.
(Oo) Othello silt loam, silty substratum.
(Pk) Pocomoke loam.
(Po) Portsmouth loam.
(Pr) Portsmouth silt loam.

These soils are much more extensive and widespread than the soils in any other capability unit in Somerset County. They occur in practically all parts of the county, though only in small, scattered areas in the extreme northeastern part. These soils occupy about 83,277 acres, or about 39.2 percent of the county, including marshlands. They make up at least 54 percent of the agricultural land in the county.

The soils in this capability unit are used in much the same way as the soils in unit IIIw–6. They are used mostly for corn, soybeans, hay, and pasture, but a large acreage is wooded. Small grain and alfalfa are not well adapted to these soils, but in adequately drained areas crop rotations include some small grain. Drainage is somewhat more difficult than on soils in capability unit IIIw–6, for closer spacing of tile lines or open ditches is needed. Open V-type ditches are suitable, but they should not penetrate the sandy substratum of most of these soils.

In addition to a complete drainage system, the soils of this unit need fertility maintenance. Since they are strongly acid, they should be frequently tested for lime needs.

The proper use and management of the extensive soils in this capability unit is most important in the agricultural economy of the county, though the soils are not so productive as other soils in the county.

CAPABILITY UNIT IIIw–10

This capability unit consists of somewhat poorly drained and moderately well drained soils that are loamy sand throughout. These soils have a rapidly permeable subsoil, but their water table is high part of the year, particularly in winter and spring. They are—

(KnA) Klej loamy sand, 0 to 2 percent slopes.
(KnB) Klej loamy sand, 2 to 5 percent slopes.

These soils occur mostly in the sandier northeastern parts of the county. They occupy about 2,230 acres, or less than 1 percent of the county.

Besides having impeded drainage and a high water table, these soils are rapidly permeable, strongly acid, and low in plant nutrients. Although they are wet in wet periods, they store little moisture for plants in dry seasons. Surface drainage is needed if yields are to be favorable, but drainage systems are difficult to maintain because ditches are clogged by caving sides and flowing sands. Supplemental irrigation should be available when needed in dry seasons, and fertility should be especially well maintained. Under good management, most crops of the area can be grown successfully.

CAPABILITY UNIT IIIs–1

This capability unit consists of deep, rapidly permeable, somewhat excessively drained loamy sands. The soils are—

(GcB) Galestown loamy sand, clayey substratum, 0 to 5 percent slopes.
(LaB) Lakeland loamy sand, clayey substratum, 0 to 5 percent slopes.
(LgB) Lakeland-Galestown loamy sands, clayey substratum, 2 to 5 percent slopes.

These soils are mostly along the northeastern boundary of the county, though small areas are scattered elsewhere, particularly along the Wicomico River. The total acreage is small in this county.

These soils are acid, very sandy and permeable, and low in content of plant nutrients and organic matter. Also, they have only a small capacity to retain moisture, though finer textured, moisture-bearing strata are commonly within 5 or 6 feet of the surface. Generally, these soils are not damaged by water, but if left bare, they are highly susceptible to wind erosion. Management should provide close-growing crops, crop strips that run crosswise to the direction of the prevailing wind, and crop residues at or near the surface. Windbreaks may also be used. Large amounts of fertilizer and some lime are needed; they should be applied as indicated by soil tests. Because of seasonal droughtiness, water for supplemental irrigation should be available. These soils are intensively used for vegetables and other crops of high value.

CAPABILITY UNIT IVe–3

This capability unit consists of deep, well-drained silty soils on moderate to strong slopes. These soils are very severely limited by erosion or the hazard of erosion. They are—

(MkC3) Matapeake silt loam, 5 to 10 percent slopes, severely eroded.
(MkD) Matapeake silt loam, 10 to 15 percent slopes.

These soils occupy only about 143 acres, or much less than 0.1 percent of the county.

Although these soils are generally steeper or more severely eroded than the soil in capability unit IIIe–4, they are somewhat similar to that soil and are used in about the same ways. They are less well suited for cultivation, however, because they are more susceptible to further erosion. Used to combat erosion are stripcrops, contour cultivation, buffer strips, crop residues, and in some places, terraces. Surface runoff should be safely disposed of through diversions, sodded waterways, and outlets that are carefully prepared and maintained. Under careful management, favorable yields of all crops adapted to the area may be expected, particularly if rotations lasting 4 years or more are used and the surface is protected by close-growing vegetation most of the time.

CAPABILITY UNIT IVe–5

This capability unit consists of strongly sloping and severely eroded, deep, well-drained soils that have a sandy loam or loamy sand surface layer and a finer textured, moderately permeable subsoil. These soils are very se-

verely limited by the hazard of erosion. They are—

(DoC3) Downer loamy sand, 5 to 10 percent slopes, severely eroded.
(SfC3) Sassafras sandy loam, 5 to 10 percent slopes, severely eroded.
(SfD) Sassafras sandy loam, 10 to 15 percent slopes.

These soils occupy 342 acres in this county and are mostly in the northern part high above the Wicomico River. The management needed for producing crops is much the same as that suggested for the silty soils in capability unit IVe–3. However, the soils in this capability unit have a sandier surface layer and are easier to work than the soils in capability unit IVe–3. Unless fertility is especially well maintained, these soils may be less productive than those of capability unit IVe–3. Windbreaks are useful in areas exposed to strong winds.

CAPABILITY UNIT IVw–6

Plummer loamy sand (Pd) is the only soil in this capability unit. Although this soil is very sandy and rapidly permeable, it is poorly drained. The poor drainage is caused by a water table that is high for long periods.

Most of this soil is in the northeastern part of the county. It occupies only about 310 acres, or about 0.2 percent of the county.

Poor drainage, sandiness, low fertility, and extreme acidity limit the use of this soil for crops. Well-controlled drainage is required if yields are to be even moderate. Either tile or ditches can be used for drainage, but tile is expensive for such a low-producing soil, and ditches are difficult to maintain because they are clogged by caving and flowing sand. Special attention must be given to maintaining fertility. If this soil is drained and managed well, it is best suited to corn, soybeans, and some truck crops, including those grown in home gardens. Much of the soil is still wooded.

CAPABILITY UNIT Vw–1

Othello silt loam, low (Om), is the only soil in this capability unit. This silty soil has a slowly or very slowly permeable subsoil and is poorly drained. Because it is almost at sea level, it is subject to occasional flooding by high tides.

This soil is adjacent to salt water in several parts of the county, mostly in the Fairmount and Crisfield areas. It amounts to about 1,644 acres, or about 0.8 percent of the county.

This soil may remain wet for much of the year and is very difficult or impractical to drain. It is not suited to crops or to ordinary means of cultivation, but fairly good pasture and some tame or wild hay can be produced. If the herbage is overgrazed, the soil is not seriously damaged by grazing animals. Pasture improvement includes clearing, destroying brush, seeding or sprigging, fertilizing, liming, and mowing as needed. Loblolly pine, the only important forest tree, grows very slowly; it is frequently damaged and sometimes killed by salt water. Timber management is not economical under present conditions.

CAPABILITY UNIT Vw–5

This capability unit consists of poorly drained and very poorly drained, very acid sandy soils that have an organic hardpan in the subsoil and a water table that is high or very high much of the time. The soils are—

(Lo) Leon loamy sand.
(Sa) St. Johns loamy sand.

These soils occur almost entirely in the northeastern part of the county, near the Worcester County line. They total only about 213 acres, or about 0.1 percent of the county.

These soils are so acid, wet, and sandy that they are not suitable for regular cultivation of crops commonly grown in the county. They produce timber, however, and if brush and weeds are removed, some fairly good pasture. If the pasture is greatly improved, the cost of this improvement probably cannot be met by return from the increase in yields. Under special management, small amounts of blueberries or other acid-tolerant crops may be produced.

CAPABILITY UNIT VIe–2

Steep sandy land (St), the only soil in this capability unit, is moderately well drained and well drained. It is so steep that regular cultivation is hazardous because it is likely to cause erosion.

This land consists of many small, scattered strips of several different kinds of soils. It is in blufflike areas, generally adjacent to streams or rivers, and is on short, steep slopes between uplands and streams or their flood plains. Most areas are narrow and are fairly long. This land totals only about 204 acres, or about 0.1 percent of the county.

This land is too steep for cultivation, but many areas produce some timber and, under careful management, produce pasture for limited grazing. If strips between uplands and stream bottoms are kept in permanent vegetation, they act as buffers and help to protect the lower lands from the sand or silt that is washed in by excess surface runoff. Also, this land provides excellent shelter for wildlife, particularly quail and rabbits.

CAPABILITY UNIT VIw–1

Only Mixed alluvial land (Mx) is in this capability unit. This land is on nearly level flood plains that are frequently flooded and consist of varied materials that may change with each flood. Some of the flooding is damaging.

Most of this land is along the middle part of the large streams that originate in this county. The land totals about 416 acres, or 0.2 percent of the county.

This kind of land is frequently damaged by overwash, overflow, or both. In some places it is badly washed or channeled and has on the surface mixed deposits of sand, clay, or gravel. It is suited as wet woodland, consisting generally of hardwoods, or for limited grazing by livestock. Stream channels should be cleaned, straightened, or even deepened where practical so that the danger of flooding is lessened. In other respects, management is much the same as that suggested for the soil in capability unit Vw–1. If this land is used for grazing, livestock should be excluded during periods of overflow.

CAPABILITY UNIT VIw–2

This capability unit consists of nearly level, poorly drained soils that have a hard or a sticky and plastic sur-

face layer and a slowly or very slowly permeable subsoil. These soils have a surface layer that is hard when dry, firm or tough when moist, and sticky and somewhat plastic when dry. They are—

(Os) Othello silty clay loam.
(Ot) Othello silty clay loam, silty substratum.

These soils occur mostly in some of the more nearly level areas in the western and southern parts of the county. They make up one of the most extensive capability units in the county. The total area is about 12,630 acres, or nearly 6 percent of the county.

These soils are so wet, so difficult to drain, and so difficult to work that they cannot be easily cultivated. They can be worked within only a very narrow range of moisture content, and within this range they are intractable and tough. The subsoil of these soils is so fine textured and slowly permeable that drainage is generally impractical. These soils are mostly in forests that include some good stands of loblolly pine. Grazing could be improved by seeding or sprigging, by fertilizing and liming, and by controlling weeds and brush.

CAPABILITY UNIT VIIw-1

This capability unit consists of very wet organic land types on which drainage is impractical. The land types are—

(My) Muck and peat.
(Sw) Swamp.

These land types occupy the wettest and most consistently waterlogged nonsaline parts of the county. They are most extensive in the general area called Pocomoke Swamp, where they occur along the Pocomoke River in disconnected areas that extend upstream from just below Rehobeth to the vicinity of Cokesbury Church. In other parts of the county they are in smaller scattered areas. These land types occupy about 5,019 acres, or about 2.4 percent of the county.

Because drainage is impossible in some places and impractial or too expensive in others, none of this land is cultivated. At times of low water, livestock may browse a little, but generally these land types are suited only as wet woodland or for wildlife shelter. Some forested areas produce marketable timber, but most areas are much too wet to be managed for timber production.

CAPABILITY UNIT VIIs-1

This unit consists of deep, droughty sands on nearly level to moderate slopes and loamy sands in rolling, dunelike areas. The soils are—

(GlB) Galestown-Lakeland sands, 0 to 5 percent slopes.
(GlC) Galestown-Lakeland sands, 5 to 10 percent slopes.
(LmC) Lakeland-Galestown loamy sands, 5 to 10 percent slopes.

These soils occupy about 604 acres in this county.

Under special management, these soils can be used for some crops, but ordinarily they are used only as woodland. In a few spots some melons are grown, and there are a few home gardens, but these generally require special care. Most of the acreage is in scrubby trees, but it could be improved by good management and by planting loblolly pine or other commercially valuable trees. Because cleared areas tend to blow when the wind is strong, protective vegetation should be kept on these soils.

CAPABILITY UNIT VIIIw-1

Only Tidal marsh (Tm) is in this capability unit. It consists of lands likely to be flooded by salt water.

Tidal marsh amounts to 55,415 acres, or about 26.7 percent of the county. It is adjacent to salt water along estuaries and on most of the islands in the county. Areas range from small and disconnected to large and continuous.

This land type has no agricultural value at present or in the foreseeable future, but the marshes are excellent areas for wildlife, particularly raccoon, muskrat, and many kinds of waterfowl and other birds. The uses of the different kinds of marshland in the county for wildlife and for recreational purposes are discussed in the subsection "Wildlife."

CAPABILITY UNIT VIIIs-2

Only Coastal beaches (Cb) are in this capability unit. They consist of almost barren, incoherent loose sands.

These sandy beaches border the Chesapeake Bay and some of the large rivers. Their acreage depends on how much the sands have been shifted by waves, tides, and winds, but it is generally about 580 acres, or about 0.2 percent of the county.

These beaches are suitable for various kinds of recreation, though they have no agricultural value. They are also feeding areas for some kinds of waterfowl and for raccoon and other animals. Some areas that are high enough above the level of normal high tides have brush or trees, including loblolly pine or Virginia pine, but the growth of pine trees is very slow and survival is uncertain.

CAPABILITY UNIT VIIIs-4

This capability unit consists only of Gravel and borrow pits (Gp). These pits are in areas where the soils have been removed so that the underlying material can be used for construction.

At the time the survey was made, these pits occupied about 99 acres, but this acreage varies from time to time.

Without complete reclamation, areas of these pits serve no agricultural purpose. Possibly, reclamation for each site would be different. Brush, trees, and various small plants may invade these pits, but such growth is of little or no economic value. At best, these areas serve as cover for wildlife, but generally they are used for further excavation of sand and gravel.

General Management Practices

Although many soils in the county vary in their suitability for specific crops and require widely different management, basic management practices that are similar are needed on practically all of the soils. This subsection discusses the basic practices of improving drainage, adding amendments, rotating crops, tilling, and using windbreaks.

Improving drainage

Improving drainage is perhaps the most serious management problem in Somerset County. Drainage is needed on nearly 88 percent of the area suitable for crops, or about 114,000 acres. Unless drainage is well established and maintained on this acreage, crops have poor yields

Figure 14.—**Standing water after a heavy rain on poorly drained Fallsington soils and very poorly drained Pocomoke soils. The deeper water is on the Pocomoke soils.**

or fail completely. On only a few farms are all of the soils well drained.

Of the cropland needing drainage, about 87 percent, or nearly 100,000 acres, is made up of poorly drained or very poorly drained soils. Drainage must be greatly improved on these soils if the production of nearly all kinds of crops is to be successful. Figure 14 shows what may happen when rains are heavy on poorly drained and very poorly drained soils for which ditches or other means of drainage have not been provided.

Either open ditches or tile may be used in Somerset County, but tile functions well only in the less clayey soils that permit water to move through them readily.

The selection, construction, and maintenance of a drainage system depend on the kind of soil, the depth of the soil, and the nature of the underlying material. Ditchbanks are difficult to maintain in shallow soils that are underlain by loose sandy material because this material caves in and partly fills the ditches (fig. 15). In soils of this kind, tile lines may require less maintenance than ditches, but some ditchbanks can be stabilized by vegetation (fig. 16). In the Keyport and other deep, coherent soils, ditches are less likely to clog and are easier to maintain than those in sandy soils, though initial construction in the coherent soils may be more expensive.

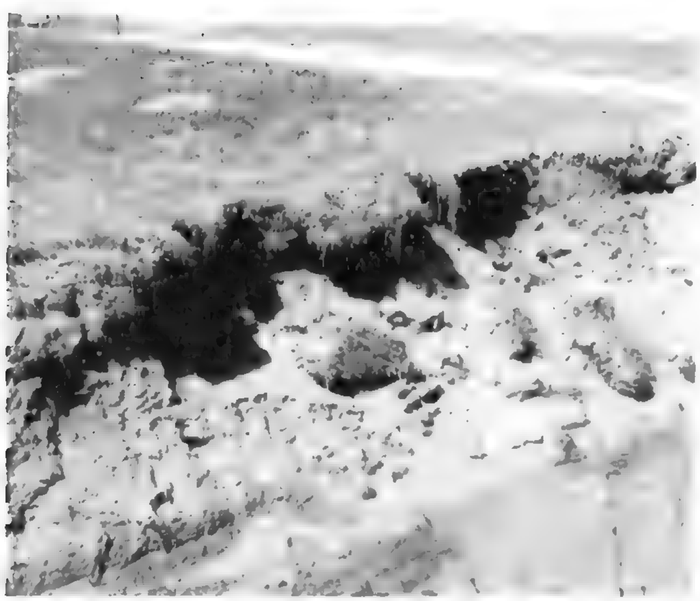

Figure 15.—**Poorly drained ditchbank in a sandy soil.**

In many cultivated areas excess water is removed through a network of small lateral ditches or tile lines that feed into larger ditches. The larger ditches feed into a natural drainageway. The number and spacing of the lateral ditches depend on the kind of soil. Only a few widely spaced laterals are needed on the moderately well drained Woodstown soils, but many closely spaced laterals are needed on very poorly drained Portsmouth soils.

Figure 16.—**A 5-year-old ditchbank near Princess Anne. The sericea lespedeza helps to prevent caving and also furnishes food for wildlife.**

Many farmers use a plow or other tools to build low ridges between lateral ditches so that the soil surface slopes gently from the top of the ridges toward the ditches. This ridging is effective on the Pocomoke, Plummer, Fallsington, Johnston, and other very wet soils.

The spacing required for tile lines largely depends on the kind of soil and the slope. For tile drainage to be effective on the Portsmouth and other of the finer textured, slowly permeable soils, the lines should be close together, though even then they may not function well. Tile lines can be spaced widely apart on the Klej, Plummer, and other porous, sandy soils.

More information on drainage systems is given in the subsection "Soil Groups for Drainage" beginning on page 58. A table in that subsection lists soils in groups, according to drainage requirements, and gives suitable drainage structures for the groups.

Soil amendments

Because all of the soils in the county are acid, and none of them are naturally high in plant nutrients, additions of fertilizer and lime are needed for most crops. Helpful

in estimating the kinds and amounts of lime and fertilizer needed are knowing how crops have responded to amendments in the past, the yield level the farmer desires, and the previous treatments. Especially important are the results of soil tests. For assistance in determining the specific requirements of soils for lime and fertilizer, farmers should request the county agricultural agent to make arrangements for testing his soils at the Soil Testing Laboratory of the University of Maryland.

Generally, lime should be applied once every 3 years. Ordinarily, well drained and moderately well drained, very sandy soils require about 1 to 1½ tons per acre. Most other soils in the county require 2 or 3 tons every 3 years, but the Pocomoke, Portsmouth, and other wet soils that are high in organic-matter content may require 3 to 5 tons or more.

Soils that are cultivated year after year become deficient in nitrogen, phosphorus, and potassium unless these nutrients are regularly replaced. Unlike phosphorus and potassium, nitrogen does not come from the soil itself. Nitrogen is produced by plants, especially soybeans and other legumes, but it can also be supplied by adding fertilizer. Nitrogen fertilizer is needed for all crops except legumes, and at times some legumes benefit from added nitrogen. Some of the nitrogen in plants is returned to the soil in plant residues, which decompose into organic matter, but most of the nitrogen generally is removed in the crops harvested. Manure also furnishes considerable amounts of nitrogen and organic matter and smaller amounts of other plant nutrients.

Crop rotations

By using a good crop rotation the organic matter in the soil can be maintained. A good rotation also helps to lessen the loss of soil by erosion. A satisfactory rotation consists of a legume or a green-manure crop followed by corn. If the legume or green-manure crop is plowed under, organic matter and nitrogen are added to the soil and benefit the corn that follows. Such a rotation also helps crops to withstand dry weather and erosion. This cropping system can be lengthened to 3 years by seeding a small grain to follow the corn and a hay crop or a legume or a legume-grass mixture to follow the small grain. Soybeans can be substituted for the corn. This rotation does much to conserve the soil and is well suited to soils of capability classes I and II.

Soils in capability subclasses IIIe and IIIs need a rotation that lasts at least 4 years and includes hay or another close-growing crop for at least 2 years. Such a rotation may not be suitable for soils of subclass IIIw, because there is little or no hazard of erosion on those soils. Most soils of subclass IVe need a 5-year rotation, or a 4-year rotation in which the small grain has been omitted. Because soybeans encourage erosion, they should not be planted on soils of subclass IVe.

Rotations also help to control weeds, insects, and soil-borne disease. In addition, they slow the rate at which some plant nutrients are depleted. In some fields of vegetables or other crops, where insecticides or fungicides have been heavily applied, growing different kinds of crops for at least 1 or 2 years lessens the residual effects of these chemicals.

Tillage

If yields of crops are to be high, the soils must be kept in good physical condition. Tillage of any kind breaks down the structure of the soil, causes a loss of organic matter, and increases the hazard of erosion. The breakdown of soil structure generally is gradual and normally is not noticed until damage is serious.

If heavy machines are continuously used to cultivate corn and soybeans on Othello silt loam or other poorly drained, finer textured soils, these soils are compacted and made hard to work. The damage is more serious if the soil is wet when the machines are used. The rate water infiltrates into the soil and the degree of aeration are decreased by compaction. Also, internal drainage is slowed. If a sloping soil is compacted, the amount and

Figure 17.—**Soils of subclass IIe that have been planted on the contour.**

rate of runoff are accelerated and the erosion hazard is increased. In such a soil, replenishing organic matter and growing a sod crop help to restore good structure.

On all the soils in the county, cultivation should be kept to a minimum. By plow planting, or by a variation of it called lister planting, the cultivations, or trips over a field with heavy machinery, are reduced. Another trip with heavy machinery can be eliminated by placing a harrow behind the plow and ahead of the seeder. Particularly important is cultivating within a narrow range of moisture content so as to prevent puddling and compaction on many of the wet, finer textured soils.

All sloping soils that are subject to erosion but are suitable for cultivation should be tilled on the contour (fig. 17). Many of the soils in subclasses IIe, IIIe, and IVe are of this kind. In addition, contour stripcropping is needed on the soils in subclasses IIIe and IVe. In contour stripcropping, strips of clean-cultivated crops are alternated with strips of close-growing, untilled crops. A good rotation can be used and the crops alternated on the various strips. The strips should be narrower in the steeper areas than in the less sloping ones. A representative of the Soil Conservation Service may be consulted for help in planning and laying out crop strips.

Windbreaks

In Somerset County, soil blowing is serious only in places where the soil is left loose and unprotected late in winter and early in spring when the prevailing winds are usually strongest. Blowing is also likely on soils that are plowed in fall and left bare through winter.

In this county the soils most susceptible to blowing are in capability units IIs-4, IIIe-33, IIIs-1, and VIIs-1. These soils can be protected by a cover of almost any kind of vegetation, but if the sandier soils must be left exposed, windbreaks lessen the hazard of blowing.

Trees, shrubs, and tall grasses break the force of the wind. They lessen the picking up of soil material by the wind, and they catch or block airborne particles as well.

White pine is a suitable tree for large, tall windbreaks. The trees should be planted so close that the branch tips of adjacent trees touch or nearly touch as the trees approach maturity. Additional protection is given by branches that are close to the ground if white pine is planted in rows and the trees are not crowded. Fortunately, white pine grows well in the sandy soils of the county that need protection from the wind. Other useful evergreens are pyramidal arborvitae and columnar arborvitae. Rows of these trees attain a height of about 30 feet, though individual trees grow even taller.

Many smaller trees and shrubs are useful in providing protection, particularly if they are planted within the protected areas in rows at intervals. These low windbreaks furnish food for birds and other wildlife, as well as protect the soil from blowing. For this reason, Tartarian honeysuckle, a large shrub, and autumn olive are especially useful in windbreak plantings. Less useful for wildlife food but suitable for protection are the privets or ligustrums, particularly the Amur River, Ibelium, and California varieties. Fortunately, all of these shrubs are well suited to the sandy soils of Somerset County.

Nurserymen, landscape specialists, and technicians of the Soil Conservation Service can assist landowners in planning windbreaks. Particularly important in this planning is selecting suitable trees and shrubs, determining the spacing of the trees and shrubs in the rows, and determining the width of the intervals between the rows.

Estimated Yields

The soils of Somerset County vary considerably in productivity. Some of them consistently produce fairly high yields of cultivated crops, but others are better suited to less intensive use.

Table 5 shows the average estimated yields of specified general crops under two levels of management. In columns A are estimated average acre yields of specified crops obtained under management commonly used in the county. In columns B are estimated acre yields obtained under improved management. Strawberries, vegetables, or other special crops of high value are not included in table 5, because soils used for these crops are normally managed at the highest level feasible and no great improvement over present yields is expected.

According to the U.S. Census of Agriculture, in 1960 the average acre yield of corn in Somerset County was 51 bushels. Other average yields reported were 24 bushels of soybeans, 37 bushels of barley, 34 bushels of oats, 25 bushels of wheat, and 21 bushels of rye.

Of the small grain, table 5 lists only barley and rye, the two most commonly grown in the county. Expected yields for oats should be about the same as those for barley, or slightly less. Yields for wheat should be about the same as those for rye, or slightly more.

The yields listed in columns B can be considered goals, though they are not presumed to be the maximum attainable. Crop varieties and management technique will improve, and yields probably will increase accordingly. To

TABLE 5.—*Estimated average acre yields of principal crops under two levels of management*

[In columns A are yields obtained under management commonly used in the county; those in columns B are estimated yields obtained under improved management. Absence of figure indicates crop is not suited to the soil specified or is not commonly grown on it]

Map symbol	Soil	Corn		Soybeans		Barley		Rye		Tall-grass pasture	
		A	B	A	B	A	B	A	B	A	B
		Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
DoA	Downer loamy sand, 0 to 2 percent slopes	45	115	17	40	22	57	15	36	60	150
DoB	Downer loamy sand, 2 to 5 percent slopes	45	115	17	40	22	57	15	36	60	150
DoC	Downer loamy sand, 5 to 10 percent slopes	45	110	16	40	21	54	14	36	60	145
DoC3	Downer loamy sand, 5 to 10 percent slopes, severely eroded	40	100	15	38	19	40	13	34	50	135
Fa	Fallsington loam	50	95	18	34	24	45	16	31	70	135
Fb	Fallsington sandy loam	50	95	18	34	24	45	16	31	70	135
FdA	Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes	50	95	18	34	24	45	16	31	70	135
FdB	Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes	55	105	20	38	26	49	18	34	75	145
FgA	Fallsington and Dragston loams, 0 to 2 percent slopes	50	95	18	34	24	45	16	31	70	135
FgB	Fallsington and Dragston loams, 2 to 5 percent slopes	55	105	20	38	26	49	18	34	75	145

See footnote at end of table.

TABLE 5.—*Estimated average acre yields of principal crops under two levels of management*—Continued

Map symbol	Soil	Corn		Soybeans		Barley		Rye		Tall-grass pasture	
		A	B	A	B	A	B	A	B	A	B
		Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
GcB	Galestown loamy sand, clayey substratum, 0 to 5 percent slopes	40	105	16	40	21	54	14	36	55	140
GlB	Galestown-Lakeland sands, 0 to 5 percent slopes	---	---	---	---	---	---	---	---	35	110
GlC	Galestown-Lakeland sands, 5 to 10 percent slopes	---	---	---	---	---	---	---	---	35	100
Jo	Johnston loam	50	95	18	34	24	45	16	31	70	135
KfA	Keyport fine sandy loam, 0 to 2 percent slopes	55	110	20	38	26	49	18	34	75	145
KmA	Keyport silt loam, 0 to 2 percent slopes	55	110	20	38	26	49	18	34	75	145
KnA	Klej loamy sand, 0 to 2 percent slopes	35	90	14	37	19	48	13	33	55	135
KnB	Klej loamy sand, 2 to 5 percent slopes	35	95	15	39	20	51	14	35	55	140
LaB	Lakeland loamy sand, clayey substratum, 0 to 5 percent slopes	40	105	16	40	21	54	14	36	55	140
LgB	Lakeland-Galestown loamy sands, clayey substratum, 2 to 5 percent slopes	40	105	16	40	21	54	14	36	55	140
LmC	Lakeland-Galestown loamy sands, 5 to 10 percent slopes	---	---	---	---	---	---	---	---	40	115
Lo	Leon loamy sand	---	45	---	17	---	---	---	---	---	65
MfA	Matapeake fine sandy loam, 0 to 2 percent slopes	70	135	25	40	33	62	22	36	90	170
MfB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded	65	130	24	40	31	60	22	36	85	165
MfC	Matapeake fine sandy loam, 5 to 10 percent slopes	65	125	24	40	31	59	22	36	85	165
MkA	Matapeake silt loam, 0 to 2 percent slopes	70	135	25	40	33	62	22	36	90	170
MkB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded	65	130	24	40	31	60	22	36	85	165
MkC2	Matapeake silt loam, 5 to 10 percent slopes, moderately eroded	60	120	23	40	30	58	21	36	80	160
MkC3	Matapeake silt loam, 5 to 10 percent slopes, severely eroded	55	115	20	40	26	53	20	36	75	150
MkD	Matapeake silt loam, 10 to 15 percent slopes	60	120	23	40	30	58	21	36	80	160
MpA	Mattapex fine sandy loam, 0 to 2 percent slopes	60	120	23	40	29	56	21	36	85	160
MpB2	Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded	60	125	23	40	28	55	21	36	85	170
MsA	Mattapex silt loam, 0 to 2 percent slopes	60	120	23	40	29	56	21	36	85	160
MsB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded	60	125	23	40	28	55	21	36	85	170
OhA	Othello silt loam, 0 to 2 percent slopes	55	105	19	36	25	47	17	32	80	145
OnB2	Othello silt loam, 2 to 5 percent slopes, moderately eroded	55	115	20	38	25	47	18	34	80	150
Om	Othello silt loam, low	---	---	---	---	---	---	---	---	60	115
Oo	Othello silt loam, silty substratum	55	105	19	36	25	47	17	32	80	145
Os	Othello silty clay loam	---	---	---	---	---	---	---	---	80	145
Ot	Othello silty clay loam, silty substratum	---	---	---	---	---	---	---	---	80	145
Pd	Plummer loamy sand	---	50	---	22	---	---	---	---	---	85
Pk	Pocomoke loam	50	95	18	34	24	45	16	31	70	135
Pm	Pocomoke sandy loam	50	95	18	34	24	45	16	31	70	135
Po	Portsmouth loam	55	105	19	36	25	47	17	32	80	145
Pr	Portsmouth silt loam	55	105	19	36	25	47	17	32	80	145
Sa	St. Johns loamy sand	---	55	---	19	---	---	---	---	35	75
SfA	Sassafras sandy loam, 0 to 2 percent slopes	65	125	24	40	32	60	22	36	85	160
SfB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded	60	120	23	40	30	58	21	36	80	155
SfC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded	60	115	22	40	28	55	20	36	80	150
SfC3	Sassafras sandy loam, 5 to 10 percent slopes, severely eroded	55	110	20	38	26	49	18	34	75	140
SfD	Sassafras sandy loam, 10 to 15 percent slopes	60	110	22	40	28	54	20	36	80	150
WdA	Woodstown loam, 0 to 2 percent slopes	55	110	22	40	29	54	20	36	80	150
WdB2	Woodstown loam, 2 to 5 percent slopes, moderately eroded	60	115	23	40	30	57	21	36	85	160
WoA	Woodstown sandy loam, 0 to 2 percent slopes	55	110	22	40	29	54	20	36	80	150
WoB2	Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded	60	115	23	40	30	57	21	36	85	160

[1] The number of days in a year 1 acre will graze a cow, a horse, or a steer without injury to the pasture.

obtain the yields shown in columns B, several or many of the following practices are used.

1. Contour tillage, stripcropping, terracing, or contour furrowing or similar measures are used to help control erosion; the soils that need drainage are drained; excess water is disposed of rapidly; and irrigation is supplied to the parts that need it.
2. Crop varieties that are suited to the soil are selected.
3. Rotations of adequate length are used that generally consist of the following: A tilled crop to help control weeds; a deep-rooted crop to improve permeability; a legume for 1 or more years to help maintain or improve fertility; and a close-growing crop or a green-manure crop to improve soil structure and tilth, to supply organic matter, and to control erosion.
4. Manure and crop residues are turned under to supply nitrogen and other nutrients and to improve the physical condition of the soil.
5. Fertilizer and lime are applied according to the needs indicated by soil tests; the county agent is consulted about making the tests.
6. Suitable methods of plowing, preparing the seedbed, and cultivating are used.
7. Planting, cultivating, and harvesting are done at the proper time and in the proper way.
8. Weeds, diseases, and insects are controlled.

Woodland Management

Practically no true virgin forests remain in Somerset County. A few tracts, however, show no evidence of having been altered by the activities of man or domestic animals. In 1959, according to the U.S. Census of Agriculture, there were about 106,000 acres of woodland in the county. This acreage amounted to two-thirds of the land area of the county, not including the treeless marshes. About one-third of the woodland was on farms. Interest in managing woodland has increased in the past few years.

The value of standing commercial timber sold from farms was $82,133 in 1949, $47,290 in 1954, and $76,765 in 1960 (*4*). No figures are available on the amount of timber cut during any of those years. The increased interest in woodland management, the increasing demand for pulpwood, and the higher prices for wood products indicate that the amount of wood products produced in the county will increase.

About 70 percent of the land area of Somerset County can produce loblolly pine commercially, and 25 percent can produce large amounts of that important tree. This potential is an important factor in planning for long-term use, particularly of the wet lands that need artificial drainage.

Woodland suitability groups of soils

Just as soils were placed in capability units according to their suitability for crops and pasture, they can also be grouped according to their suitability for woodland use. Each woodland suitability group is made up of soils that produce similar kinds of wood crops, that need similar management practices, and that have similar potential productivity.

The potential of a soil for producing forest trees is measured by the site index. The site index is the average

TABLE 6. —*Woodland*

Woodland groups and map symbols	Site index for loblolly pine	Species priority for—	
		Timber	Christmas trees
Group 1 (Fa, Fb, FdA, FdB, FgA, FgB, Pk, Pm, Po, Pr).	85 to 94+	Loblolly pine, sweetgum, mixed oaks, yellow-poplar.	Scotch pine, white pine, Austrian pine
Group 2 (Jo, Mx)	85 to 94+	Mixed oaks, sweetgum, yellow-poplar, loblolly pine.	Scotch pine, white pine
Group 3 (KnA, KnB, WdA, WdB2, WoA, WoB2).	85 to 94—	Loblolly pine, yellow-poplar, sweetgum, mixed oaks, Virginia pine.	Scotch pine, Norway spruce, Austrian pine, white pine.
Group 5 (GcB, GlB, GlC, LaB, LgB, LmC).	75 to 84	Loblolly pine, shortleaf pine, Virginia pine.	Scotch pine, white pine, Virginia pine
Group 7 (DoA, DoB, MfA, MfB2, MkA, MkB2, SfA, SfB2).	75 to 84	Loblolly pine, shortleaf pine, Virginia pine, mixed oaks.	Scotch pine, Norway spruce, Austrian pine, white pine.
Group 8 (DoC, MfC, MkC2, MkD, SfC2, SfD).	75 to 84	Loblolly pine, shortleaf pine, Virginia pine, mixed oaks.	Scotch pine, Norway spruce, Austrian pine, white pine.
Group 9 (St)	75 to 84	Loblolly pine, mixed oaks, shortleaf pine, Virginia pine.	Scotch pine, Norway spruce, Austrian pine.
Group 10 (Lo, OhA, OhB2, Oo, Os, Ot, Pd, Sa).	75 to 84	Loblolly pine, mixed oaks	Scotch pine, white pine, Austrian pine
Group 11 (KfA, KmA, MpA, MpB2, MsA, MsB2).	75 to 84	Loblolly pine, mixed oaks, sweetgum	Scotch pine, Norway spruce, Austrian pine.
Group 13 (DoC3, MkC3, SfC3)	65 to 74	Loblolly pine, shortleaf pine, Virginia pine.	Scotch pine, Norway spruce, Austrian pine, white pine.
Group 19 (Om)	<65	Loblolly pine	
Group 20 (Cb)	<50	Virginia pine, loblolly pine	
Group 21 (Gp, Ma, My, Sw, Tm)	([1])	Variable	Variable

[1] Not available.

height, in feet, of the dominant trees in a stand at 50 years of age. To date, the site indexes of trees on the Eastern Shore of Maryland have been determined only for loblolly pine. Loblolly pine is the most important species grown commercially in the area.

A number of studies of site indexes were made to determine the value of soils for growing trees. The areas studied were on soils of the Coastal Plain of Maryland. They were located not only in Somerset County, but also in all the counties of the Eastern Shore, in Calvert, Charles, and St. Marys Counties in southern Maryland, and in Sussex County, Del. The site indexes used in this report are based on these studies.

On some soils trees were measured on a fairly large number of sites. On others only a few suitable sites were available where the stand of loblolly pine was good. No measurements were taken on some soils, but the site index was assumed to be approximately the same as that for soils that had similar characteristics.

All the soils in one woodland suitability group have approximately the same site index and are similar in other respects. For all the soils in a group, species priority is about the same, and the rating is the same for competition from other plants, limitations to the use of equipment, seedling mortality, the hazard of windthrow, and the hazard of erosion.

Table 6 shows the 13 woodland suitability groups in Somerset County and lists the symbols of the soils in each group. For each group, there are listed the range of site index, species priority, and a rating of the hazards of seedling mortality, plant competition, limitations to the use of equipment, erosion, and windthrow. The interpretations in table 6 are based on the experiences of specialists in the field of tree-soil relationships. The number for the groups are not consecutive, because the groups in this county are part of a statewide system, and not all groups of the system are represented in Somerset County.

In table 6, plant competition, limitations to the use of equipment, seedling mortality, and the hazards of erosion and of windthrow are rated as slight, moderate, or severe.

Plant competition refers to the competition from undesirable species that invade when openings are made in the canopy. The rating of limitations to the use of equipment was based on the degree that properties of soils and topographic features restrict or prohibit the use of equipment commonly employed in tending a crop of trees or in harvesting the trees. Seedling mortality refers to the expected degree of mortality of naturally occurring or planted tree seedlings as influenced by the kind of soil. The rating for hazard of windthrow is determined on the basis of properties of the soils that influence the development of tree roots. The rating for hazard of erosion is determined on the basis of the erodibility of the soil when not fully protected by a woodland cover, as in seedling stages of tree growth or after clean harvesting.

WOODLAND SUITABILITY GROUP 1

This woodland group consists of poorly drained and very poorly drained soils on upland flats. The surface layer of these soils ranges from sandy loam to silt loam, and the subsoil ranges from heavy sandy loam to silty

suitability groups of soils

Seedling mortality	Plant competition for—		Limitations to use of equipment	Hazard of erosion	Hazard of windthrow
	Conifers	Hardwoods			
Slight	Severe	Moderate	Severe because of wetness	Slight	Slight.
Moderate because of flooding	Severe	Moderate	Severe because of wetness and flooding.	Slight	Slight.
Slight	Severe	Moderate	Moderate because of wetness	Slight	Slight.
Moderate because of droughtiness	Slight	Slight	Moderate because of looseness	Slight	Slight.
Slight	Moderate	Slight	Slight	Slight	Slight.
Slight	Moderate	Slight	Slight	Moderate	Slight.
Slight	Moderate	Slight	Severe because of steep slopes	Severe	Moderate.
Slight	Moderate	Severe	Severe because of wetness	Slight	Slight to moderate.
Slight	Severe	Moderate	Moderate because of wetness	Slight	Moderate.
Moderate because of droughtiness and a poor seedbed.	Slight	Slight	Moderate because of strong slopes	Severe	Moderate.
Severe because of salt and flooding	Slight	Slight	Severe because of wetness and flooding.	Slight	Slight.
Severe because of droughtiness, saltiness, and windiness.	Slight	Slight	Severe because of instability of the sand.	Severe	Slight.
Variable	Variable	Variable	Variable	Variable	Variable.

clay loam. Small areas of these soils are in depressions that may be ponded in very wet periods. The soils are—

(Fa) Fallsington loam.
(Fb) Fallsington sandy loam.
(FcA) Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes.
(FdB) Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes.
(FgA) Fallsington and Dragston loams, 0 to 2 percent slopes.
(FgB) Fallsington and Dragston loams, 2 to 5 percent slopes.
(Pk) Pocomoke loam.
(Pm) Pocomoke sandy loam.
(Po) Portsmouth loam.
(Pr) Portsmouth silt loam.

These soils total about 45,378 acres, or slightly more than 21 percent of the county.

On these soils loblolly pine should have first priority for planting. Valuable oak and sweetgum trees that may be growing should be well managed and protected until they reach maturity and are harvested; after they are harvested, they should be replaced by loblolly pine. In places sloping enough to have good drainage, yellow-poplar should be encouraged.

Figure 18.—**Cutting an unmanaged, 60-year-old stand of loblolly pine on Fallsington sandy loam. The yield of merchantable timber per acre is about 19,000 board feet.**

On soils of this group a well-stocked, unmanaged stand of loblolly pines 50 years old that has an average height of 85 feet yields about 14,000 board feet of merchantable timber per acre, or about 65 cords of pulpwood. Each year for the next 10 to 20 years, the additional increase per acre for this kind of stand is about 500 board feet, or about one-half cord of pulpwood (fig. 18).

On all of the soils in this group, Scotch pine and white pine are suitable for producing Christmas trees commercially. Austrian pine grows well on the Fallsington and Dragston soils.

WOODLAND SUITABILITY GROUP 2

This woodland group consists of silty to sandy soils that occur on the flood plains of the county and are poorly drained or very poorly drained. Although these soils are flooded once or twice each year, the water seldom remains on the soils for long periods and is not likely to stagnate. The floods, however, may scour these soils or deposit new materials. The soils are—

(Jo) Johnston loam.
(Mx) Mixed alluvial land.

These soils occupy about 2,267 acres, or about 1.1 percent of the county.

On these soils loblolly pine should have first priority in any plantings, but sweetgum and oaks should be encouraged wherever they grow in adequate stands. Management may also encourage yellow-poplar on hummocks, along the natural levees of streams, and in any other areas where surface drainage is good.

Yields of a well-stocked, unmanaged stand of loblolly pine are the same as those on woodland suitability group 1.

WOODLAND SUITABILITY GROUP 3

This woodland group consists of moderately well drained and somewhat poorly drained soils that have a loose sandy to friable sandy clay loam subsoil. The soils are—

(KnA) Klej loamy sand, 0 to 2 percent slopes.
(KnB) Klej loamy sand, 2 to 5 percent slopes.
(WdA) Woodstown loam, 0 to 2 percent slopes.
(WdB2) Woodstown loam, 2 to 5 percent slopes, moderately eroded.
(WoA) Woodstown sandy loam, 0 to 2 percent slopes.
(WoB2) Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.

These soils occupy about 6,667 acres, or about 3.1 percent of the county.

Existing stands of yellow-poplar, sweetgum, oaks, or Virginia pine should be well managed on these soils, but after the trees are harvested, loblolly pine should be planted. Loblolly pine should have first priority in all plantings.

Yields of a well-stocked, unmanaged stand of loblolly pine are the same as those on woodland suitability group 1.

WOODLAND SUITABILITY GROUP 5

This woodland group consists of deep, very sandy, droughty soils. They are—

(GcB) Galestown loamy sand, clayey substratum, 0 to 5 percent slopes.
(GlB) Galestown-Lakeland sands, 0 to 5 percent slopes.
(GlC) Galestown-Lakeland sands, 5 to 10 percent slopes.
(LaB) Lakeland loamy sand, clayey substratum, 0 to 5 percent slopes.
(LgB) Lakeland-Galestown loamy sands, clayey substratum, 2 to 5 percent slopes.
(LmC) Lakeland-Galestown loamy sands, 5 to 10 percent slopes.

These soils occupy about 1,578 acres, or 0.8 percent of the county.

Loblolly pine should have first priority on these soils, but existing Virginia pine or shortleaf pine may be allowed to reach marketable size. After they are cut, loblolly pine should be planted. Most hardwoods grow slowly on these soils.

A well-stocked, unmanaged stand of loblolly pine 50 years old that has an average height of 80 feet yields about 11,500 board feet of merchantable timber per acre, or about 60 cords of pulpwood. Each year for the next 10 to 20 years, the additional increase per acre for this kind of stand is about 400 board feet, or about one-half cord of pulpwood (fig. 19).

Figure 19.—**Loblolly pine growing on Lakeland loamy sand, clayey substratum, 0 to 5 percent slopes. Woodland suitability group 5.**

WOODLAND SUITABILITY GROUP 7

This woodland group consists of well-drained, nearly level to gently sloping soils that have a friable or firm sandy loam to silty clay loam suboil. The soils are—

(DoA) Downer loamy sand, 0 to 2 percent slopes.
(DoB) Downer loamy sand, 2 to 5 percent slopes.
(MfA) Matapeake fine sandy loam, 0 to 2 percent slopes.
(MfB2) Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded.
(MkA) Matapeake silt loam, 0 to 2 percent slopes.
(MkB2) Matapeake silt loam, 2 to 5 percent slopes, moderately eroded.
(SfA) Sassafras sandy loam, 0 to 2 percent slopes.
(SfB2) Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded.

These soils occupy about 15,596 acres, or nearly 7.4 percent of the county.

Loblolly pine should have first priority for planting on these soils, though Virginia pine and shortleaf pine also grow well. The soils of this group generally are not well suited to hardwoods, but a good natural stand of hardwoods should be properly managed until the trees are ready for harvesting.

Yields of a well-stocked, unmanaged stand of loblolly pine are the same as those on woodland suitability group 5.

WOODLAND SUITABILITY GROUP 8

This woodland group consists of well-drained soils that have a subsoil of friable or firm sandy loam to silty clay loam. The soils are—

(DoC) Downer loamy sand, 5 to 10 percent slopes.
(MfC) Matapeake fine sandy loam, 5 to 10 percent slopes.
(MkC2) Matapeake silt loam, 5 to 10 percent slopes, moderately eroded.
(MkD) Matapeake silt loam, 10 to 15 percent slopes.
(SfC2) Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded.
(SfD) Sassafras sandy loam, 10 to 15 percent slopes.

These soils occupy about 677 acres, or 0.3 percent of the county.

The soils in this group are suited to the same kinds of trees as are the soils in woodland suitability group 5. Yields of a well-stocked, unmanaged stand of loblolly pine are the same as those on woodland suitability group 5.

WOODLAND SUITABILITY GROUP 9

Only Steep sandy land (St) is in this woodland group. It is moderately well drained to excessively drained.

This land type occupies only about 204 acres, or less than 0.1 percent of the county.

On this land, the order of priority for planting is loblolly pine, and Virginia pine, but an existing stand of commercially valuable oak should be managed. The pine can be planted after the oak is harvested.

Yields of a well-stocked, unmanaged stand of loblolly pine are about the same as those on woodland suitability group 5.

WOODLAND SUITABILITY GROUP 10

This woodland group consists of poorly drained and very poorly drained loamy sands, silt loams, and silty clay loams on level to gently sloping uplands. The sandier soils in this group have a subsoil that is dark colored, is high in organic-matter content, and contains a hardpan. The soils are—

(Lo) Leon loamy sand.
(OhA) Othello silt loam, 0 to 2 percent slopes.
(OhB2) Othello silt loam, 2 to 5 percent slopes, moderately eroded.
(Oo) Othello silt loam, silty substratum.
(Os) Othello silty clay loam.
(Ot) Othello silty clay loam, silty substratum.
(Pd) Plummer loamy sand.
(Sa) St. Johns loamy sand.

This is the most extensive woodland suitability group in Somerset County. It occupies 64,709 acres, or slightly more than 30 percent of the county.

On these soils loblolly pine has first priority for plantings, but the good existing stands of mixed hardwoods, mainly oaks, should be encouraged. These stands are probably best on the Othello soils.

The hazard of windthrow is slight on the Othello soils and is moderate on the Leon and the St. Johns soils. The hardpan in the Leon and St. Johns soils limits the depth that tree roots can penetrate.

Yields of a well-stocked, unmanaged stand of loblolly pine are the same as those on woodland suitability group 5.

WOODLAND SUITABILITY GROUP 11

This woodland group consists of moderately well drained soils that have a firm silty clay loam to heavy clay subsoil. The soils are—

(KfA) Keyport fine sandy loam, 0 to 2 percent slopes.
(KmA) Keyport silt loam, 0 to 2 percent slopes.
(MpA) Mattapex fine sandy loam, 0 to 2 percent slopes.
(MpB2) Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded.
(MsA) Mattapex silt loam, 0 to 2 percent slopes.
(MsB2) Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.

These soils occupy 12,488 acres, or about 5.9 percent of the county.

Loblolly pine is the favored species on these soils. The oak and sweetgum trees that are growing should be well managed and allowed to reach marketable size. After they are harvested, they should be replaced by loblolly pine.

Yields of a well-stocked, unmanaged stand of loblolly pine are about the same as those on woodland suitability group 5.

WOODLAND SUITABILITY GROUP 13

This woodland group consists of severely eroded, well-drained soils that have a friable to firm sandy loam to silty clay loam subsoil. The soils are—

(DoC3) Downer loamy sand, 5 to 10 percent slopes, severely eroded.
(MkC3) Matapeake silt loam, 5 to 10 percent slopes, severely eroded.
(SfC3) Sassafras sandy loam, 5 to 10 percent slopes, severely eroded.

These soils occupy only 220 acres, or about 0.1 percent of the county.

Loblolly pine should have first priority for planting on these soils, but shortleaf pine and Virginia pine also grow well. Generally, the soils in this group are not well suited to hardwoods.

On soils of this group, a well-stocked, unmanaged stand of loblolly pine 50 years old that has an average height of 70 feet yields about 6,500 board feet of merchantable timber per acre, or about 50 cords of pulpwood. Each year for the next 10 to 20 years, the additional increase per acre for this kind of stand is about 300 board feet, or about four-tenths cord of pulpwood. Although trees for timber grow fairly slowly on the soils in this group, Christmas trees can be grown for sale. Scotch pine, Norway spruce, Austrian pine, and white pine are the most suitable trees.

WOODLAND SUITABILITY GROUP 19

The only soil in this woodland group is Othello silt loam, low (Om), a poorly drained soil that occupies low positions and is subject to flooding by salt water during extremely high tides. Trees may be affected by the salt spray.

This soil occupies about 1,644 acres, or about 0.8 percent of the county.

Loblolly pine can be grown for pulpwood, but it grows too slowly for the commercial production of sawtimber. A stand of loblolly pine 50 years old yields about 40 cords of pulpwood, and a stand 70 years old yields about 50 cords.

This soil is not suitable for the commercial production of Christmas trees.

WOODLAND SUITABILITY GROUP 20

Only Coastal beaches (Cb) are in this woodland suitability group. Its soil material is noncoherent, loose sand.

This land type occupies about 583 acres, or about 0.3 percent of the county.

On Coastal beaches trees grow too slowly for them to be produced commercially, but in some areas stands of loblolly pine and Virginia pine are fairly good. Either kind of tree can be planted to stabilize the sand or for esthetic purposes, but seedling mortality will be severe because of droughtiness, salt effects, and wind erosion.

Erosion is almost entirely wind erosion. The wind may uproot young trees by blowing sand from around their roots, or it may cover the young trees with sand. In addition, young seedlings and other trees are severely damaged by the cutting effect of the wind.

This land type is not suitable for the commercial production of Christmas trees.

WOODLAND SUITABILITY GROUP 21

This woodland group consists of land types that are commonly not suited to trees. They are—

(Gp) Gravel and borrow pits.
(Ma) Made land.
(My) Muck and peat.
(Sw) Swamp.
(Tm) Tidal marsh.

These land types occupy about 60,474 acres, or nearly 29 percent of the county. Of this area, 54,986 acres is Tidal marsh.

Generally, each site in this woodland group must be evaluated for its suitability for trees. Trees can be planted on Gravel and borrow pits, but their rate of growth is unpredictable and a wood crop is unlikely. Made land is used almost entirely for residential, commercial, and other building sites. In many places Muck and peat, as well as Swamp, have a cover typical of wet woodland, but economic production of trees cannot be predicted and generally is not feasible. In their natural state the tidal marshes do not support trees.

Wildlife

Most of the birds and animals that frequent the general area known as the Eastern Shore are abundant in Somerset County, and the development of their habitats fits in well with other agricultural uses of the soils.

In the county about 55 percent of the land is at least fair as a habitat for open-land wildlife, and of this area about 15 percent is well suited. *Open-land wildlife* includes rabbits, some deer, and quail and other upland birds. About 70 percent of the land is at least fair as a habitat for woodland wildlife. *Woodland wildlife* consists of deer, squirrels, turkeys, and other animals and birds. About 82 percent of the county is at least fair as a habitat for wetland wildlife, and of this nearly 55 percent is well suited. *Wetland wildlife* includes raccoons and muskrats, as well as rails, ducks, geese and other waterfowl.

This subsection has two main parts. In the first part the soils of the county are rated according to (1) their suitability for vegetational and structural elements of wildlife habitat and (2) their suitability as habitats for open-land wildlife, woodland wildlife, and wetland wildlife. The second part describes the types of marshland in the county and rates these according to their suitability for kinds of wildlife.

Suitability of soils for wildlife

Birds and mammals frequent areas that provide the kind of food and cover that they prefer or that is necessary for their survival. For that reason, the soils of Somerset County have been rated in table 7 according to their suitability for creating, improving, and maintaining wildlife habitats, and for kinds of wildlife. The ratings given in table 7 are well suited, or above average; suitable, or average; poorly suited, or below average; and not suitable. The following gives examples of the plants in the plant categories of table 7 and tells something about the properties of soils suitable for water developments.

Grain: Valuable for wildlife are corn, sorghum, millet, soybeans, buckwheat, cowpeas, oats, barley, rye, and other grain grown for seed or for grain.

TABLE 7.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*

[A rating of 1 denotes well suited or above average; 2 denotes suitable or average; 3 denotes poorly suited or below average; and 4 denotes not suitable. Gravel and borrow pits (Gp) and Made land (Ma) not rated]

Map symbol	Soil	Elements of wildlife habitat								Kinds of wildlife		
		Grain	Legumes and grasses	Wild herbaceous upland plants	Hardwood trees and shrubs	Coniferous trees and shrubs	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
Cb	Coastal beaches	4	4	4	4	4	4	4	4	4	4	4
DoA	Downer loamy sand, 0 to 2 percent slopes.	2	1	1	1	3	4	4	4	1	1	4
DoB	Downer loamy sand, 2 to 5 percent slopes.	2	1	1	1	3	4	4	4	1	1	4
DoC	Downer loamy sand, 5 to 10 percent slopes.	2	1	1	1	3	4	4	4	1	1	4
DoC3	Downer loamy sand, 5 to 10 percent slopes, severely eroded.	3	2	1	1	3	4	4	4	2	2	4
Fa	Fallsington loam	3	2	2	1	2	1	1	1	2	1	1
Fb	Fallsington sandy loam.	3	2	2	1	2	1	1	1	2	1	1
FdA	Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes.	3	2	2	1	2	1	1	1	2	1	1
FgA	Fallsington and Dragston loams, 0 to 2 percent slopes.	3	2	2	1	2	1	1	1	2	1	1
FdB	Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes.	3	2	2	1	2	3	4	4	2	1	4
FgB	Fallsington and Dragston loams, 2 to 5 percent slopes.	3	2	2	1	2	3	4	4	2	1	4
GcB	Galestown loamy sand, clayey substratum, 0 to 5 percent slopes.	3	3	3	3	2	4	4	4	3	3	4
GlB	Galestown-Lakeland sands, 0 to 5 percent slopes.	4	4	3	3	1	4	4	4	4	3	4
GlC	Galestown-Lakeland sands, 5 to 10 percent slopes.	4	4	3	3	1	4	4	4	4	3	4
Jo	Johnston loam	4	3	3	1	1	1	3	4	3	1	2
KfA	Keyport fine sandy loam, 0 to 2 percent slopes.	2	1	1	1	3	3	3	3	1	1	3
KmA	Keyport silt loam, 0 to 2 percent slopes.	2	1	1	1	3	3	3	3	1	1	3
KnA	Klej loamy sand, 0 to 2 percent slopes.	3	2	2	2	3	3	3	3	2	3	3
KnB	Klej loamy sand, 2 to 5 percent slopes.	3	2	2	2	3	4	4	4	2	3	4
LaB	Lakeland loamy sand, clayey substratum, 0 to 5 percent slopes.	3	3	3	3	2	4	4	4	3	3	4
LgB	Lakeland-Galestown loamy sands, clayey substratum, 2 to 5 percent slopes.	3	3	3	3	2	4	4	4	3	3	4
LmC	Lakeland-Galestown loamy sands, 5 to 10 percent slopes.	4	3	3	3	1	4	4	4	4	3	4

Table 7.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*—Continued

Map symbol	Soil	Elements of wildlife habitat								Kinds of wildlife		
		Grain	Legumes and grasses	Wild herbaceous upland plants	Hardwood trees and shrubs	Coniferous trees and shrubs	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
Lo	Leon loamy sand	3	2	2	1	2	1	1	1	2	1	1
MfA	Matapeake fine sandy loam, 0 to 2 percent slopes.	1	1	1	1	3	4	4	4	1	1	4
MkA	Matapeake silt loam, 0 to 2 percent slopes.	1	1	1	1	3	4	4	4	1	1	4
MfB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded.	2	1	1	1	3	4	4	4	1	1	4
MkB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded.	2	1	1	1	3	4	4	4	1	1	4
MfC	Matapeake fine sandy loam, 5 to 10 percent slopes.	2	1	1	1	3	4	4	4	1	1	4
MkC2	Matapeake silt loam, 5 to 10 percent slopes, moderately eroded.	2	1	1	1	3	4	4	4	1	1	4
MkC3	Matapeake silt loam, 5 to 10 percent slopes, severely eroded.	3	2	1	1	3	4	4	4	2	2	4
MkD	Matapeake silt loam, 10 to 15 percent slopes.	3	2	1	1	3	4	4	4	2	2	4
MpA	Mattapex fine sandy loam, 0 to 2 percent slopes.	2	1	1	1	3	3	3	3	1	1	3
MsA	Mattapex silt loam, 0 to 2 percent slopes.	2	1	1	1	3	3	3	3	1	1	3
MpB2	Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded.	2	1	1	1	3	4	4	4	1	1	4
MsB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.	2	1	1	1	3	4	4	4	1	1	4
Mx	Mixed alluvial land	3	3	3	1	1	1	3	4	3	1	2
My	Muck and peat	4	3	4	4	1	2	1	1	4	4	1
OhA	Othello silt loam, 0 to 2 percent slopes.	3	2	2	1	2	1	1	1	2	1	1
Oo	Othello silt loam, silty substratum.	3	2	2	1	2	1	1	1	2	1	1
OhB2	Othello silt loam, 2 to 5 percent slopes, moderately eroded.	3	2	2	1	2	3	4	4	2	1	4
Om	Othello silt loam, low	4	3	3	4	4	1	1	4	4	4	1
Os	Othello silty clay loam	4	3	2	1	2	1	1	1	3	2	1
Ot	Othello silty clay loam, silty substratum.	4	3	2	1	2	1	1	1	3	2	1
Pd	Plummer loamy sand	3	3	2	2	2	1	1	1	2	2	1
Pk	Pocomoke loam	3	2	2	1	2	1	1	1	2	1	1
Pm	Pocomoke sandy loam	3	2	2	1	2	1	1	1	2	1	1
Po	Portsmouth loam	4	3	3	1	1	1	1	1	3	1	1
Pr	Portsmouth silt loam	4	3	3	1	1	1	1	1	3	1	1
Sa	St. Johns loamy sand	4	3	3	1	1	1	1	1	3	1	1

TABLE 7.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*—Continued

Map symbol	Soil	Elements of wildlife habitat								Kinds of wildlife		
		Grain	Legumes and grasses	Wild herbaceous upland plants	Hardwood trees and shrubs	Coniferous trees and shrubs	Wetland food and cover plants	Shallow water developments	Excavated ponds	Openland wildlife	Woodland wildlife	Wetland wildlife
SfA	Sassafras sandy loam, 0 to 2 percent slopes.	1	1	1	1	3	4	4	4	1	1	4
SfB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded.	2	1	1	1	3	4	4	4	1	1	4
SfC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded.	2	1	1	1	3	4	4	4	1	1	4
SfC3	Sassafras sandy loam, 5 to 10 percent slopes, severely eroded.	3	2	1	1	3	4	4	4	2	2	4
SfD	Sassafras sandy loam, 10 to 15 percent slopes.	3	2	1	1	3	4	4	4	2	2	4
St	Steep sandy land	4	3	1	1	3	4	4	4	3	2	4
Sw	Swamp	4	4	4	4	4	1	1	1	4	4	1
Tm	Tidal marsh	4	4	4	4	4	1	3	4	4	4	2
WdA	Woodstown loam, 0 to 2 percent slopes.	2	1	1	1	3	3	3	3	1	1	3
WoA	Woodstown sandy loam, 0 to 2 percent slopes.	2	1	1	1	3	3	3	3	1	1	3
WdB2	Woodstown loam, 2 to 5 percent slopes, moderately eroded.	2	1	1	1	3	4	4	4	1	2	4
WoB2	Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.	2	1	1	1	3	4	4	4	1	2	4

Legumes and grasses: Lespedeza, alfalfa, alsike clover, ladino clover, red clover, tall fescue, bromegrass, bluegrass, and timothy are legumes and grasses valued as wildlife food and cover.

Wild herbaceous upland plants: Among these plants that wildlife use as food or cover are panicgrass and other native grasses, partridgepeas, beggartick, various native lespedezas, and native herbs.

Hardwood trees and shrubs: Valuable for wildlife because, when they are planted or grow naturally, they grow vigorously and produce a good crop of fruit or seed. Such trees and shrubs are sumac, dogwood, persimmon, sassafras, hazelnut, shrub lespedezas, multiflora rose, autumn-olive, wild cherry, various oaks and hickories, bayberry, blueberry, huckleberry, highbush cranberry, blackhaw, sweetgum, and various hollies.

Coniferous trees and shrubs: Valuable for wildlife food and cover are Virginia pine, loblolly pine, shortleaf pine, red pine, Scotch pine, pond pine, Norway spruce, red cedar, and Atlantic white-cedar. In table 7 the soils are rated on the basis of slow growth and delayed canopy closure.

Wetland plants for food and cover: Examples of plants that provide food and cover for waterfowl and fur-bearing animals are smartweed, wildrice, barnyard grass, bulrush, duckweed, arrow-arum, pickerelweed, waterwillow, cattail, and various sedges.

Shallow water developments: Soils are rated for their suitability for wetland habitat development by diking, ditching, or other water control. In or on soils suitable for these impoundments, the level of water can be manipulated within the range of the normal water table and an average height of 2 feet above the ground.

Excavated ponds: Examples are dugout areas or combinations of dugout ponds with low dikes that hold enough water of suitable quality to support fish or wildlife. These ponds must not depend on runoff

TABLE 8.—*Suitability of marsh types for species of wildlife*

Species	Type I	Type II	Type IV	Type V
Muskrat	Excellent food and cover	Excellent food and cover	Fair food and cover	Poor food and cover.
Raccoon	Excellent food and cover	Excellent food and cover	Fair food and cover	Poor food and cover.
Rail	Excellent	Excellent	Excellent for nesting	Poor.
Nesting ducks	Excellent for wood duck	Good	Excellent for teal and black ducks.	Good for black ducks.
Wilson's snipe	(1)	Excellent	(1)	(1).
Migratory ducks	Excellent	Excellent	Good	Good.
Geese	Good	Good	Poor	Poor.

[1] Not rated.

from surrounding areas, though that water may help to keep the pond at the desired level.

Farm ponds of the impounded type are not included in table 7, but they may be important in producing fresh water fish. If fish are to be produced, part of a farm pond should be at least 6 feet deep. Listed in table 11, in the subsection "Engineering Uses of the Soils," is the kind or kinds of farm ponds—excavated or impounded—suitable for each soil in the county.

Suitability of marshland for wildlife

Areas of Tidal marsh in Somerset County are generally used only as wildlife habitats and as recreational areas, for these areas are not suitable for pasture, field crops, or trees. Marshland is extensive in Maryland, and it varies, particularly in plant cover, according to tidal fluctuations and the degree of salinity of the tidal waters. Six marsh types have been recognized in the State on the basis of dominant vegetation (*5*, *12*). Only four of these types—I, II, IV, and V—cover large enough areas in Somerset County to be important. These four types are described in the following paragraphs and, in table 8, are rated according to their suitability for muskrat, raccoon, rail, nesting ducks, Wilson's snipe, migratory ducks, and geese.

Type I is called the cattail type, though the vegetation includes pickerelweed, wildrice, arrow-arum, spikerushes, sedges, wild millet, and smartweed. The plants of this type occupy only about 2 percent of the marshland in the county and are along the upper reaches of streams where tides are slight and the water is nearly fresh or only slightly saline. In these areas the muskrat population is high and rails are commonly abundant. The food of high quality makes the areas excellent for migratory waterfowl and for waterfowl that spend the winter in the area. Except by wood ducks, there is little nesting.

Type II marsh is a transitional type that occupies 4 percent of the tidal marshland in the county. In addition to most of the vegetation of type I, type II marsh has many plants that are more tolerant of salt than the plants of type I. These plants more tolerant of salt include Olney's three-square, big cordgrass, smooth cordgrass, and marshhay cordgrass. In type II marsh the muskrat population is usually high. Wilson's snipe, locally called jacksnipe, are usually abundant during migration in spring and fall. Several kinds of rails frequent areas of type II marsh, and wintering waterfowl are usually abundant.

Type IV marsh is called the three-square-cordgrass-needlerush type. The vegetation consists principally of about equal proportions of Olney's three-square, needlerush, marshhay cordgrass, and smooth cordgrass. This marsh type is relatively dry and is only occasionally flooded by high tides. It makes up about 14 percent of the marshland of the county and occurs mostly in the marshes of Dames Quarter and in smaller areas of St. Pierre Marsh, St. Peters Marsh, and Monie Marsh. Muskrats are abundant in type IV marsh; most of them are in areas where Olney's three-square is plentiful. Many rails, black ducks, and blue-winged teal nest in type IV marsh. Migratory ducks are common.

Type V marsh is the needlerush-saltmeadow-cordgrass type. Areas of this type are fairly high and are seldom flooded. High-tide bush, groundsel bush, and switchgrass are common on some of the higher areas. This type amounts to about 77 percent of the total marshland in the county. It occurs throughout the marshland and is almost the only type south of the Big Annemessex River and on the bay islands (fig. 20). Black ducks are usually abundant in type V marsh (*3*), but migratory waterfowl are few. Muskrats are not abundant, and there are few other animals.

***Figure 20.*—Type V marsh in which needlerush is the most abundant plant.**

Engineering Uses of the Soils

This subsection has five main parts. The first part consists of data obtained by testing soil samples that were taken at a number of locations. In the second part, the soils of the county are described from an engineering viewpoint and properties important in engineering are estimated. The third part interprets properties as they relate to engineering work. Soils are grouped, in the fourth part, according to their suitability for irrigation. In the fifth part, soils are grouped according to the similarity of their drainage requirements.

This part of the report is a guide to properties of the soil and to the influence of these properties on problems relating to engineering. The facts on which the subsection is based were obtained by testing soil samples taken at a number of locations. By using the results of these tests, and by carefully comparing the soils tested with the other kinds of soils in the county, estimates were made of engineering properties of all the soils in the county. By using this test data and the estimates, and with the help to experienced engineers, interpretations were made that will help builders and others in planning and performing engineering work.

With the use of the soil map for identification, the engineering interpretations reported here can be useful for many purposes. It should be emphasized that they may not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads and where the excavations are deeper than the depth of the layers here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some terms used by soil scientists may not be familiar to engineers, and other terms may have a special meaning in soil science. These terms are defined in the Glossary at the back of the report.

Soil test data

Samples that represent eight series were taken from 28 locations in Somerset County and were tested by the Bureau of Public Roads (BPR) according to standard procedures of the American Association of State Highway Officials (AASHO) (*1*). The data obtained from these tests are given in table 9.

Table 9 also gives two systems of engineering classification for each soil sample—the AASHO system and the Unified system (*13*). These classifications are based on data obtained by mechanical analyses and by tests made to determine the liquid limit and the plastic limit.

The tests for the liquid limit and plastic limit measure the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a semisolid to a plastic state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the material passes from a semisolid to a plastic state. The liquid limit is the moisture content at which the soil material passes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is in a plastic condition. Some silty and sandy soils are nonplastic; that is, they do not become plastic at any moisture content.

Engineering descriptions and physical properties

A brief description of the soils in this county is given in table 10. This table lists the symbol of each that is shown on the detailed soil map and the name of the soil, but the land types Gravel and borrow pits, Made land, and Steep sandy land are not listed. For each significant horizon, the table gives the textural classification generally used by the U.S. Department of Agriculture and the two most widely used engineering classifications. Color and other characteristics that are not important in engineering have been omitted, but other general characteristics of the profile are described. Also described is the nature of the parent material or other substratum, drainage characteristics, and, where it is known and is significant, the depth of the water table.

Unless otherwise indicated, the descriptions of the physical properties in table 10 apply to soils that are not more than slightly eroded. In learning about the Downer soils, for example, it must be considered that most or even all of the surface layer of Downer loamy sand, 5 to 10 percent slopes, severely eroded, has been washed or blown away.

The thickness of the soil horizons below the surface layer also varies somewhat from place to place. The thickness and other properties described in table 10 are properties that actually exist in a specific profile of the soil described.

The rate indicated for permeability is the rate that water moves through the soil material in areas that have not been disturbed. Permeability depends largely on the texture and the structure of the soil.

The shrink-swell potential indicates the volume change to be expected when the content of soil moisture changes. It is estimated primarily on the basis of the amount and type of clay in a horizon. In general, horizons classified as CH and A–7 have a high shrink-swell potential, as does the silty clay horizon of the Keyport fine sandy loam listed in table 10. Sand or gravel containing little or no plastic or slightly plastic fines have low shrink-swell potential and may be classified as SP and A–3. The lower horizon of the Klej loamy sands is of this kind.

Soil interpretations for engineering

Table 11 rates the soils in the county according to their suitability as sources of topsoil, sand, gravel, and road fill. It also names good or undesirable soil features that affect engineering practices and structures and, therefore, must be considered in planning, design, construction, and maintenance. The eight land types in the county are not listed in table 11.

A soil that is suitable for one engineering use may be poor or even unsuitable for some other use. For example, Fallsington soils are good as a source of topsoil and are fair as a source of road fill. The Galestown soils, on the other hand, are fair as a source of topsoil and are poor as a source of road fill.

TABLE 9.—*Engineering test data for*

[Tests performed by Bureau of Public Roads (BPR) in accordance with standard

Soil name and location	BPR report number	Depth	Horizon	Mechanical analyses[1]		
				Percentage passing sieve		
				1 in.	¾ in.	No. 4 (4.76 mm.)
		Inches				
Downer loamy sand (modal): 1 mile southeast of Costen Station.	S-38959	0-9	Ap			
	S-38960	9-20	B2t			
	S-38961	33-48	C2			
Downer loamy sand: 3.5 miles east of Eden.	S-38962	0-5	A2			
	S-38963	11-20	B22t			
	S-38964	30-50	D1			
Downer loamy sand: 0.5 mile east of Redding Ferry Road and 1.1 miles north of Polk Road.	S-39226	0-8	Ap			
	S-39227	15-22	B2t			
	S-39228	28-38	C			
Dragston fine sandy loam (modal): 4 miles east-southeast of Princess Anne.	S-38908	0-8	Ap			
	S-38909	16-25	B2t			
	S-38910	35-52	IIC2			
Dragston fine sandy loam: 2 miles north of Emanuel Church.	S-38911	3-7	A2			
	S-38912	14-21	B2t			
	S-38913	35-60	IIC2g			
Dragston loam: 0.5 mile east of U.S. Highway No. 13 and 300 feet north of State Route 388.	S-39215	0-8	Ap			
	S-39216	13-21	B2t		100	99
	S-39217	21-36	C1		100	98
	S-39218	36-50	C2g		100	97
Fallsington loam: 2,500 feet south of intersection of Eden-Allen Road and Backbone Road and 800 feet south of bend in Sea Tick Road.	S-38920	11-24	B2tg			
	S-38921	24-38	B3g			
	S-38922	38-43	Cg			
Fallsington fine sandy loam (modal): 300 feet east of Boston Road on north side of Perryhawkin Road.	S-38917	0-9	Ap			
	S-38918	14-24	B21tg			
	S-38919	37-54	IICg			
Fallsington sandy loam: 0.2 mile north of intersection of Five Bridges Road and Pete's Hill Road.	S-38923	0-7	Ap			
	S-38924	12-19	B2tg			
	S-38925	30-50	IIC2g			
Matapeake silt loam (modal): 0.75 mile south of Princess Anne.	S-38926	0-8	Ap			
	S-38927	21-34	B22t			
	S-38928	47-55	IIC2		100	95
Matapeake silt loam: 1.5 miles west of Princess Anne.	S-38932	0-8	Ap			
	S-38933	20-28	B22t			
	S-38934	37-52	C			
Matapeake silt loam: 0.75 mile southeast of Costen Station.	S-38935	0-10	Ap			
	S-38936	15-25	B2t			
	S-38937	32-40	IIC2			
Matapeake fine sandy loam: 1 mile west of U.S. Highway No. 13 and 900 feet south of Mt. Vernon Road.	S-38929	0-6	Ap			
	S-38930	12-18	B21t			
	S-38931	30-42	C1			
Mattapex silt loam: 3 miles west of Pocomoke, in Worcester County.	S-38938	0-9	Ap			
	S-38939	24-38	B2t			
	S-38940	46-56	IICg			
Mattapex silt loam: 2.1 miles south of Costen Road and 0.2 mile west of Hayward Road.	S-38941	0-9	Ap			
	S-38942	13-26	B2t			
	S-38943	37-51	Cg			
Mattapex silt loam: 0.7 mile north of Polk Road settlement.	S-39229	0-9	Ap			
	S-39230	14-21	B2t			
	S-39231	39-55	IIC2		100	99

See footnotes at end of table.

soil samples taken from 28 soil profiles

procedures of the American Association of State Highway Officials (AASHO) (*1*)]

Mechanical analyses [1]—Continued							Liquid limit	Plasticity index	Classification	
Percentage passing sieve—Con.			Percentage smaller than—						AASHO [2]	Unified [3]
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
100	84	18	17	12	7	3	[4] NP	[4] NP	A-2-4(0)	SM.
100	86	33	32	27	17	9	16	4	A-2-4(0)	SM-SC.
100	81	10	9	8	7	4	NP	NP	A-3(0)	SP-SM.
100	85	55	53	42	23	14	21	6	A-4(4)	ML-CL.
100	79	28	27	24	17	13	18	5	A-2-4(0)	SM-SC.
100	75	11	10	9	9	7	NP	NP	A-2-4(0)	SP-SM.
100	87	27	26	18	8	5	NP	NP	A-2-4(0)	SM.
100	89	44	42	35	22	17	23	9	A-4(2)	SC.
100	88	24	23	17	11	10	NP	NP	A-2-4(0)	SM.
100	92	48	47	35	15	10	19	3	A-4(3)	SM.
100	92	53	52	40	20	15	22	7	A-4(4)	ML-CL.
100	83	22	21	17	11	7	NP	NP	A-2-4(0)	SM.
100	94	34	32	25	15	10	19	3	A-2-4(0)	SM.
100	94	38	36	29	17	10	14	2	A-4(1)	SM.
100	94	5	4	3	2	1	NP	NP	A-3(0)	SP-SM.
100	91	54	52	38	16	11	21	4	A-4(4)	ML-CL.
98	88	54	52	38	20	13	20	4	A-4(4)	ML-CL.
96	69	30	29	24	14	11	20	7	A-2-4(0)	SM-SC.
94	57	22	20	18	11	9	18	5	A-2-4(0)	SM-SC.
100	80	31	28	22	16	13	18	5	A-2-4(0)	SM-SC.
100	76	21	18	15	11	10	18	3	A-2-4(0)	SM.
100	64	9	9	8	8	7	NP	NP	A-3(0)	SP-SM.
100	94	53	51	38	17	9	19	3	A-4(4)	ML.
100	94	54	52	38	20	14	17	4	A-4(4)	ML-CL.
100	86	24	23	18	11	9	NP	NP	A-2-4(0)	SM.
100	94	36	35	27	13	8	15	2	A-4(0)	SM.
100	95	46	45	37	23	16	19	6	A-4(2)	SM-SC.
100	98	11	9	9	8	6	NP	NP	A-2-4(0)	SP-SM.
100	91	66	64	46	20	14	21	3	A-4(6)	ML.
100	93	73	71	54	25	17	23	5	A-4(8)	ML-CL.
92	70	18	17	14	10	8	NP	NP	A-2-4(0)	SM.
100	96	70	69	49	21	13	22	6	A-4(7)	ML-CL.
100	99	81	80	64	37	29	35	15	A-6(10)	CL.
100	94	28	26	24	18	14	17	1	A-2-4(0)	SM.
100	94	61	60	46	20	11	21	4	A-4(5)	ML-CL.
100	96	71	70	58	34	26	33	14	A-6(9)	CL.
100	88	22	21	18	13	9	NP	NP	A-2-4(0)	SM.
100	98	65	63	45	20	14	20	3	A-4(6)	ML.
100	98	61	59	51	31	24	27	12	A-6(6)	CL.
100	96	20	19	17	15	12	NP	NP	A-2-4(0)	SM.
100	94	50	48	37	17	10	18	3	A-4(3)	SM.
100	96	60	59	48	28	23	24	8	A-4(5)	CL.
100	93	26	25	22	18	16	19	1	A-2-4(0)	SM.
100	96	69	67	52	25	16	24	5	A-4(7)	ML-CL.
100	97	75	73	57	32	24	30	12	A-6(9)	CL.
100	86	34	33	29	21	17	25	10	A-2-4(0)	SC.
100	96	67	65	45	18	12	21	4	A-4(6)	ML-CL.
100	99	91	90	68	35	28	34	13	A-6(9)	CL.
98	92	18	17	16	11	8	NP	NP	A-2-4(0)	SM.

TABLE 9.—*Engineering test data for*

Soil name and location	BPR report number	Depth	Horizon	Mechanical analyses [1] Percentage passing sieve 1 in.	¾ in.	No. 4 (4.76 mm.)
		Inches				
Othello silt loam (modal): 0.75 mile southeast of Oriole	S-38944	2-7	A2g			
	S-38945	15-26	B22tg			
	S-38946	32-50	IIC			
Othello silt loam: 0.5 mile east of U.S. Highway No. 13 on north side of State Route 388.	S-38947	0-9	Ap			
	S-38948	14-30	B2tg		100	99
	S-38949	30-60	IIClg	100	99	86
Othello silt loam: 0.25 mile east of Redding Ferry Road and 400 feet north of Polk Road.	S-39219	0-9	A1			
	S-39220	12-33	B21tg			
	S-39221	38-47	IIClg			
Othello silt loam: 700 feet north of Revells Neck Road on west side of Stewart Neck Road.	S-39222	7-18	B1g			
	S-39223	18-26	B21tg		100	99
	S-39224	33-41	IIC1g	100	99	88
	S-39225	41-50	IIC2g		100	96
Othello silt loam, silty substratum: 3.75 miles southwest of Princess Anne.	S-38914	0-5	A1			
	S-38915	23-37	B22tg			
	S-38916	50-66	IIC2g		100	99
Othello silty clay loam: 0.5 mile east of Monie	S-38950	2-9	A2g			
	S-38951	9-20	B21tg			
	S-38952	34-50	IIC			
Pocomoke loam (modal): On north side of Backbone Road, 0.5 mile east of its intersection with Sea Tick Road.	S-39232	0-11	A1			
	S-39233	11-19	B2tg			
	S-39234	32-60	Cg			
Pocomoke loam (grading toward Portsmouth soil): 0.4 mile south of intersection of U.S. Highway No. 13 and Mennonite Church Road, and south of Greenhill.	S-38953	0-7	Ap			
	S-38954	24-32	B21tg			
	S-38955	35-42	IICg		100	96
Pocomoke sandy loam: 3.75 miles south of Fruitland	S-39235	0-8	A1			
	S-39236	14-28	B22tg			
	S-39237	28-50	Cg			
Portsmouth silt loam (modal): 0.3 mile south of Revells Neck Road on west side of U.S. Highway No. 13.	S-39241	0-11	A1			
	S-39242	18-29	B21tg			
	S-39243	47-65	IIC2g		100	97
Portsmouth silt loam: 0.25 mile north of Costen Station	S-39238	0-7	A1			
	S-39239	16-33	B22tg			
	S-39240	33-50	IICg			
Portsmouth silt loam: 0.5 mile south of Greenhill, in Somerset County	S-38956	9-17	A12g			
	S-38957	17-26	B2tg			
	S-38958	30-40	IIC2g		100	99

[1] Mechanical analyses according to the AASHO Designation: T 88-57 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses data used in this table are not suitable for naming textural classes for soils.

soil samples taken from 28 soil profiles—Continued

Mechanical analyses [1]—Continued							Liquid limit	Plasticity index	Classification	
Percentage passing sieve—Con.			Percentage smaller than—						AASHO [2]	Unified [3]
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
----------	100	93	90	65	26	16	28	6	A-4(8)	ML-CL.
----------	100	97	96	74	38	31	39	18	A-6(11)	CL.
100	96	26	21	13	6	5	NP	NP	A-2-4(0)	SM.
100	97	91	89	61	22	15	25	3	A-4(8)	ML.
98	94	87	86	69	39	30	40	18	A-6(11)	CL.
81	56	17	16	13	9	7	NP	NP	A-2-4(0)	SM.
100	99	93	91	67	32	22	37	10	A-4(8)	ML.
----------	100	96	94	70	35	27	29	10	A-4(8)	CL.
100	97	19	18	13	7	4	NP	NP	A-2-4(0)	SM.
100	98	95	94	71	37	28	35	13	A-6(9)	ML-CL.
97	88	80	78	61	35	26	33	13	A-6(9)	CL.
84	64	46	44	37	27	22	33	14	A-6(3)	SC.
92	71	56	53	43	31	27	39	17	A-6(7)	CL.
100	96	80	77	55	27	20	32	8	A-4(8)	ML-CL.
100	98	89	87	66	35	25	30	11	A-6(8)	CL.
98	91	71	68	49	28	23	27	10	A-4(7)	CL.
----------	100	93	91	68	35	26	32	9	A-4(8)	ML-CL.
----------	100	97	95	74	42	33	37	16	A-6(10)	CL.
100	99	23	18	12	6	4	NP	NP	A-2-4(0)	SM.
100	83	44	43	33	21	14	36	9	A-4(2)	SM.
100	84	47	45	34	23	17	24	8	A-4(2)	SC.
100	71	18	17	13	8	5	NP	NP	A-2-4(0)	SM.
100	98	54	52	40	20	13	29	6	A-4(4)	ML-CL.
100	98	62	60	48	25	17	22	5	A-4(5)	ML-CL.
90	84	20	19	15	8	5	NP	NP	A-2-4(0)	SM.
100	84	26	25	20	12	7	24	3	A-2-4(0)	SM.
100	86	33	32	27	19	13	19	6	A-2-4(0)	SM-SC.
100	90	16	14	13	10	8	NP	NP	A-2-4(0)	SM.
100	93	77	76	58	34	25	41	11	A-7-5(9)	ML or OL.
100	96	87	86	70	39	28	33	12	A-6(9)	CL.
94	75	34	33	29	22	19	24	10	A-2-4(0)	SC.
----------	100	94	92	71	39	28	45	11	A-7-5(9)	ML or OL.
----------	100	99	97	76	40	32	39	16	A-6(10)	CL.
100	98	20	19	17	11	8	NP	NP	A-2-4(0)	SM.
100	99	84	83	67	35	26	31	7	A-4(8)	ML-CL.
----------	100	96	95	73	35	26	35	13	A-6(9)	ML-CL.
98	94	13	11	9	6	2	NP	NP	A-2-4(0)	SM.

[2] Based on AASHO Designation: M 145-49 (*1*).
[3] Based on the Unified Soil Classification System, Tech. Memo. No. 3-357, v. 1, Corps of Engineers (*13*). SCS and Bureau of Public Roads have agreed to consider that all soils having plasticity indexes within two points of the A-line are to be given a borderline classification. Examples of borderline classifications obtained by this use are ML-CL and SM-SC.
[4] NP means nonplastic.

TABLE 10.—*Descriptions of the soils*

[Dashes indicate information

Map symbol	Soil	Description of soil and site	Depth from surface	Classification: USDA texture
			Inches	
Cb	Coastal beaches.	Loose, slightly saline to strongly saline sand; water table below 4 feet except where influenced by tides.	0–60+	Sand
DoA	Downer loamy sand, 0 to 2 percent slopes.	About 15 inches of loamy sand over about 7 inches of light sandy clay loam and that, in turn, over deep loamy sand; somewhat excessively drained; water table below 4 feet at all times.	0–15	Loamy sand
DoB	Downer loamy sand, 2 to 5 percent slopes.		15–22	Sandy clay loam
DoC	Downer loamy sand, 5 to 10 percent slopes.		22–38	Loamy sand
DoC3	Downer loamy sand, 5 to 10 percent slopes, severely eroded.			
Fa	Fallsington loam.	About 9 inches of loam, fine sandy loam, or sandy loam over 15 to 24 inches of sandy clay loam and that, in turn, over loamy sand or light sandy loam; poorly drained; water table seasonally within 1 foot of the surface.	0–9	Fine sandy loam
Fb	Fallsington sandy loam.		9–30	Sandy clay loam
FdA	Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes.		30–54	Sandy loam or loamy sand.
FdB	Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes.			
FgA	Fallsington and Dragston loams, 0 to 2 percent slopes.			
FgB	Fallsington and Dragston loams, 2 to 5 percent slopes.			
GcB	Galestown loamy sand, clayey substratum, 0 to 5 percent slopes.	About 5 feet of sand or loamy sand that grades with depth to sand; sandy loam or sandy clay loam substratum; somewhat excessively drained or excessively drained; water table seasonally in substratum.	0–40	Loamy sand or sand
GlB	Galestown-Lakeland sands, 0 to 5 percent slopes.		40–58	Sand
GlC	Galestown-Lakeland sands, 5 to 10 percent slopes.		58–66	Sandy loam
Jo	Johnston loam.	About 2 feet of highly organic loam over about 1 foot of somewhat organic loam or silt loam and that, in turn, over loose, water-bearing loamy sand; on very poorly drained flood plains; subject to flooding and ponding; water table seasonally within 1 foot of the surface.	0–25 25–37 37–50	Loam Loam or silt loam Loamy sand
KfA	Keyport fine sandy loam, 0 to 2 percent slopes.	About 9 inches of silt loam or fine sandy loam over 4 feet or more of silty clay, clay loam, or fine sandy clay loam; moderately well drained; water table seasonally about 2 feet from the surface.	0–9	Fine sandy loam or silt loam.
KmA	Keyport silt loam, 0 to 2 percent slopes.		9–31 31–45 45–55	Silty clay Clay loam Very fine sandy clay loam.
KnA	Klej loamy sand, 0 to 2 percent slopes.	About 20 inches of loamy sand over 3 feet or more of sand; moderately well drained; water table seasonally about 2 feet from the surface.	0–20	Loamy sand
KnB	Klej loamy sand, 2 to 5 percent slopes.		20–55	Sand
LaB	Lakeland loamy sand, clayey substratum, 0 to 5 percent slopes.	About 3 feet of loamy sand over about 1½ feet of sand; sandy clay loam substratum; somewhat excessively drained or excessively drained; water table seasonally in the substratum.	0–36	Loamy sand
LgB	Lakeland-Galestown loamy sands, clayey substratum, 2 to 5 percent slopes.		36–52	Sand
LmC	Lakeland-Galestown loamy sands, 5 to 10 percent slopes.		52–60	Sandy clay loam
Lo	Leon loamy sand.	About 30 inches of loose loamy sand, over about 10 inches of cemented fine sand and that, in turn, over loose sand or fine sand; somewhat poorly drained or poorly drained; water table seasonally 1½ feet or less from the surface.	0–31 31–42 42–48	Loamy sand Fine sand or sand, cemented. Fine sand or sand
MfA	Matapeake fine sandy loam, 0 to 2 percent slopes.	About 12 inches of fine sandy loam, loam, or silt loam over about 18 inches of silty clay loam and that, in turn, over sandy loam grading to loamy sand with depth; well drained; water table below 4 feet at all times.	0–12	Fine sandy loam, loam, or silt loam.
MfB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded.		12–30 30–42	Silty clay loam Sandy loam
MfC	Matapeake fine sandy loam, 5 to 10 percent slopes.		42–60	Loamy sand

and estimates of their physical properties

not applicable or not available]

Classification—Continued		Percentage passing sieve—			Range in permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 4	No. 10	No. 200				
					Inches per hour	*Inches per inch*	*pH*	
SP	A-3	100	100	0 to 5	>6. 3	----------	----	Low.
SM	A-2	100	100	15 to 30	2. 0 to 6. 3	0. 10	4. 5 to 5. 5	Low.
SC or SM	A-2 or A-4	100	100	25 to 45	0. 63 to 2. 0	. 14	4. 5 to 5. 0	Low.
SM or SP-SM	A-2 or A-3	100	100	10 to 25	2. 0 to 6. 3	. 08	4. 5 to 5. 0	Low.
SM or ML	A-2 or A-4	100	100	30 to 50	0. 20 to 2. 0	. 15	4. 0 to 5. 0	Low.
SC or ML-CL	A-2 or A-4	100	100	25 to 55	0. 20 to 0. 63	. 17	4. 0 to 5. 0	Moderate.
SM or SP-SM	A-2 or A-3	100	100	10 to 25	2. 0 to 6. 3	. 10	4. 0 to 5. 0	Low.
SM or SP-SM	A-2 or A-3	100	100	5 to 15	2. 0 to 6. 3+	. 08	4. 5 to 5. 0	Low.
SP or SP-SM	A-3	100	100	0 to 10	>6. 3	. 06	4. 5 to 5. 0	Low.
SC or SM	A-2	100	100	15 to 30	0. 20 to 2. 0	. 15	4. 0 to 5. 0	Low.
SM or OL	A-4 or A-7	100	100	35 to 60	0. 20 to 0. 63	. 20	4. 0 to 5. 0	Moderate.
ML or SC	A-4	100	100	35 to 60	0. 20 to 0. 63	. 18	4. 0 to 5. 0	Moderate.
SM or SP-SM	A-2 or A-3	100	95 to 100	5 to 15	0. 63 to 2. 0	. 08	4. 0 to 5. 0	Low.
ML	A-4	100	100	60 to 80	0. 20 to 2. 0	. 16	4. 5 to 5. 0	Low.
CL or CH	A-6 or A-7	100	100	75 to 90	<0. 20	. 18	4. 5 to 5. 0	High.
CL	A-6	100	100	50 to 80	<0. 20	. 16	4. 5 to 5. 0	Moderate.
CL or SC	A-6	100	100	40 to 60	<0. 20	. 15	4. 5 to 5. 0	Moderate.
SM	A-2	100	100	10 to 20	0. 63 to 2. 0	. 08	4. 5 to 5. 0	Low.
SP or SP-SM	A-3	100	100	0 to 10	2. 0 to 6. 3	. 06	4. 5 to 5. 5	Low.
SM or SP-SM	A-2 or A-3	100	100	5 to 15	2. 0 to 6. 3+	. 08	4. 5 to 5. 5	Low.
SP or SP-SM	A-3	100	100	0 to 10	>6. 3	. 06	4. 5 to 5. 0	Low.
SC	A-2 or A-4	100	100	30 to 45	0. 20 to 0. 63	. 15	4. 5 to 5. 0	Low.
SM or SP or SM	A-1 or A-3	100	100	5 to 15	2. 0 to 6. 3	. 08	3. 8 to 4. 5	Low.
SP-SM	A-3	100	100	5 to 10	0. 63 to 2. 0	. 06	3. 8 to 4. 5	Low.
SP	A-3	100	100	0 to 5	>6. 3	. 05	3. 8 to 4. 5	Low.
ML	A-4	100	100	60 to 75	0. 20 to 2. 0	. 16	4. 5 to 5. 0	Low.
CL	A-6	100	100	60 to 85	0. 63 to 2. 0	. 18	4. 5 to 5. 0	Moderate.
SM	A-2	100	100	15 to 30	0. 63 to 2. 0	. 14	4. 5 to 5. 0	Low.
SM	A 2	100	100	10 to 25	2. 0 to 6. 3	. 10	4. 5 to 5. 0	Low.

TABLE 10.—*Descriptions of the soils*

Map symbol	Soil	Description of soil and site	Depth from surface	Classification
				USDA texture
			Inches	
MkA	Matapeake silt loam, 0 to 2 percent slopes.			
MkB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded.			
MkC2	Matapeake silt loam, 5 to 10 percent slopes, moderately eroded.			
MkC3	Matapeake silt loam, 5 to 10 percent slopes, severely eroded.			
MkD	Matapeake silt loam, 10 to 15 percent slopes.			
MpA	Mattapex fine sandy loam, 0 to 2 percent slopes.	About 18 inches of fine sandy loam, loam, or silt loam over about 20 inches of silty clay loam underlain by about 8 inches of loam over deep fine sandy loam; moderately well drained; water table seasonally about 2 feet from the surface.	0–17	Fine sandy loam, loam, or silt loam.
MpB2	Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded.		17–38	Silty clay loam
MsA	Mattapex silt loam, 0 to 2 percent slopes.		38–46	Loam
MsB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.		46–56	Fine sandy loam
Mx	Mixed alluvial land.	Extremely variable soils on flood plains; subject to flooding.		(1)
My	Muck and peat.	Extremely variable deposits of organic material; water table permanently at or above surface.		Muck or peat
OhA	Othello silt loam, 0 to 2 percent slopes.	About 7 inches of silt loam or light silty clay loam over silty clay loam that grades to fine sandy clay loam; fine sandy clay loam underlain by loose fine sand or loamy fine sand at a depth of about 32 inches; poorly drained; water table seasonally within 1 foot of the surface.	0–7	Silt loam or silty clay loam.
OhB2	Othello silt loam, 2 to 5 percent slopes, moderately eroded.		7–32	Silty clay loam to fine sandy clay loam.
Om	Othello silt loam, low.		32–50	Fine sand or loamy fine sand.
Os	Othello silty clay loam.			
Oo	Othello silt loam, silty substratum.	About 1 foot of silt loam or silty clay loam over about 2 feet of silty clay loam, and that, in turn, over silt loam substratum; poorly drained; water table seasonally within 1 foot of the surface.	0–11	Silt loam or silty clay loam.
Ot	Othello silty clay loam, silty substratum.		11–37	Silty clay loam
			37–66	Silt loam
Pd	Plummer loamy sand.	About 48 inches of loamy sand over sand; poorly drained; water table seasonally within 1 foot of the surface; at times ponded.	0–48	Loamy sand
			48–54	Coarse sand
Pk	Pocomoke loam.	About 14 inches of loam or sandy loam over about 12 inches of light sandy clay loam and that, in turn, over loose loamy sand; surface layer high in organic-matter content; very poorly drained; water table seasonally at or near surface; at times ponded.	0–14	Sandy loam or loam
Pm	Pocomoke sandy loam.		14–26	Sandy clay loam
			26–52	Loamy sand
Po	Portsmouth loam.	About 17 inches of highly organic silt loam or loam over about 10 inches of fine silty clay loam to silty clay and that, in turn, over sandy loam grading to loamy sand with depth; very poorly drained; water table seasonally at or near surface; at times ponded.	0–17	Silt loam or loam
Pr	Portsmouth silt loam.		17–26	Fine silty clay loam
			26–40	Loamy sand or light sandy loam.
Sa	St. Johns loamy sand.	About 18 inches of loamy sand, high in organic-matter content, over about 6 inches of cemented loamy sand and that, in turn, over loose fine sand; very poorly drained; water table seasonally at or near surface; at times ponded.	0–18	Loamy sand
			18–24	Loamy sand, cemented.
			24–48	Fine sand
SfA	Sassafras sandy loam, 0 to 2 percent slopes.	About 18 inches of sandy loam over about 14 inches of sandy clay loam and that, in turn, over loamy sand; well drained; water table below 4 feet at all times.	0–18	Sandy loam
SfB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded.		18–32	Sandy clay loam
SfC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded.		32–50	Loamy sand
SfC3	Sassafras sandy loam, 5 to 10 percent slopes, severely eroded.			
SfD	Sassafras sandy loam, 10 to 15 percent slopes.			

and estimates of their physical properties—Continued

Classification—Continued		Percentage passing sieve—			Range in permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 4	No. 10	No. 200				
					Inches per hour	*Inches per inch*	*pH*	
ML	A-4	100	98 to 100	50 to 70	0. 20 to 2. 0	0. 16	5. 0 to 5. 5	Low.
CL	A-6	100	100	60 to 90	0. 20 to 0. 63	. 18	5. 0 to 6. 0	Moderate.
ML or SM	A-4	100	98 to 100	40 to 60	0. 20 to 0. 63	. 16	4. 5 to 5. 5	Low.
SM or SC	A-2	100	98 to 100	15 to 35	0. 63 to 2. 0	. 15	4. 5 to 5. 5	Low.
(1)	(1)	(1)	(1)	(1)	---	---	---	
OL or Pt	---	---	---	---	---	---	3. 5 to 4. 0	High.
ML or CL	A-4	100	100	85 to 95	0. 20 to 0. 63	. 16	4. 0 to 5. 0	Low.
CL	A-6	100	100	75 to 95	0. 20 to 0. 63	. 18	4. 0 to 5. 0	Moderate.
SM	A-2	85 to 100	80 to 95	15 to 40	0. 20 to 2. 0	. 10	4. 5 to 5. 5	Low.
ML or CL	A-4	100	100	75 to 90	<0. 20	. 16	4. 0 to 5. 0	Moderate.
CL	A-6	100	100	80 to 95	<0. 20	. 18	4. 0 to 5. 0	High.
ML	A-4	100	90 to 100	50 to 70	0. 20 to 2. 0	. 15	4. 0 to 5. 0	Low to moderate.
SM or SP-SM	A-2 or A-3	100	100	5 to 20	0. 63 to 2. 0	. 08	4. 5 to 5. 5	Low.
SP or SP-SM	A-3	100	100	0 to 10	2. 0 to 6. 3	. 05	4. 0 to 5. 0	Low.
SM or ML	A-2 or A-4	100	100	25 to 50	0. 20 to 0. 63	. 15	4. 0 to 5. 0	Low.
SC, SM, or ML.	A-2 or A-4	100	100	30 to 60	0. 63 to 2. 0	. 17	4. 0 to 5. 0	Low.
SM	A-2	90 to 100	90 to 100	10 to 20	2. 0 to 6. 3	. 08	4. 0 to 5. 0	Low.
ML or OL	A-4 or A-7	100	100	75 to 95	<0. 20	. 16	4. 5 to 5. 0	Moderate.
CL	A-6	100	100	85 to 100	<0. 20	. 18	4. 0 to 4. 5	Moderate.
SM	A 2	95 to 100	95 to 100	10 to 25	0. 63 to 2. 0	. 08	4. 5 to 5. 5	Low.
SM or SP-SM	A-2 or A-3	100	100	5 to 15	0. 20 to 2. 0	. 10	3. 8 to 4. 5	Low.
SP-SM	A-3	100	100	5 to 10	0. 63 to 2. 0	. 08	3. 8 to 4. 5	Low.
SP	A-3	100	100	0 to 5	>6. 3	. 05	3. 8 to 4. 5	Low.
SM or ML	A-2 or A-4	95 to 100	95 to 100	30 to 55	0. 63 to 2. 0	. 15	4. 5 to 5. 5	Low.
SC or CL	A-6	100	95 to 100	40 to 60	0. 63 to 2. 0	. 17	4. 5 to 5. 5	Low.
SM	A-2	100	100	10 to 20	0. 63 to 6. 3	. 08	5. 0 to 6. 0	Low.

TABLE 10.—*Descriptions of the soils*

Map symbol	Soil	Description of soil and site	Depth from surface	Classification
				USDA texture
			Inches	
Sw	Swamp.	Variable, extremely wet, unclassified soil material; normally ponded.		(1)
Tm	Tidal marsh.	Variable, unclassified soil material; brackish to saline; subject to fluctuating tides.		(1)
WdA	Woodstown loam, 0 to 2 percent slopes.	About 18 inches of loam or sandy loam over about 6 inches of sandy clay loam underlain by about 12 inches of sandy loam over loamy sand; moderately well drained; water table seasonally about 2 feet from the surface.	0–18	Loam or sandy loam.
WdB2	Woodstown loam, 2 to 5 percent slopes, moderately eroded.		18–24	Sandy clay loam
WoA	Woodstown sandy loam, 0 to 2 percent slopes.		24–36	Sandy loam
WoB2	Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.		36–50	Loamy sand

[1] Variable.

Mainly because of their fine silty subsoil, the Portsmouth soils have moderately slow or slow permeability. This property, as shown in table 11, affects agricultural drainage. It greatly increases the difficulty of providing this drainage. Very poor drainage limits the suitability of Portsmouth soils for irrigation.

The interpretations in table 11 are general, but they do point out what the engineer may expect to find in any area of a soil that is shown on the detailed soil map. However, the interpretations do not give exact soil properties and evaluations at the precise point where an engineering project may be planned.

Irrigation groups of soils

In this subsection general practices of irrigation are discussed, and then soils suitable for conservation irrigation are grouped and these groups are described. Conservation irrigation is the application of water in amounts needed to maintain a good growth of crops, but without waste of water and without damage to the soil or to the crops.

Each year enough rain falls in Somerset County to meet agricultural needs, but annual rainfall is not always well distributed. Extended dry periods may occur between June and September. If an irrigation system is installed, and enough water is available during dry periods, favorable crop yields can be maintained during the dry periods. Sprinkler irrigation is the only method suitable in Maryland. Reference to irrigation in this report is for sprinkler irrigation only.

Conservation irrigation should be a part of a complete farm program of soil and water conservation. Because irrigation is expensive, it can be economically used only on soils that have a large increase in crop yields as a result of the irrigation. These soils should be liberally fertilized and adequately limed. The cropping system should include crops that help to control erosion, to minimize leaching, to maintain good tilth, and to furnish organic matter.

An adequate supply of water must be available if irrigation is to be successful. Trying to irrigate with too little water is a common mistake. An ordinary farm pond, for example, supplies enough water to irrigate only a small home garden.

Water for irrigation may be supplied by wells, streams, or reservoirs. A permit to drill an irrigation well or to construct a pond or reservoir must be obtained from the Department of Water Resources, State Office Building, Annapolis, Md. The Department of Geology at Johns Hopkins University can give information about the supply of ground water in most areas of the State. Drilling a test well is a good way to determine whether the supply of water is adequate.

Only streams that have a constant flow during extended droughts, and that have not been contaminated by salt water, are suitable sources of irrigation water. During periods of drought, the flow of streams should be measured and the degree of contamination should be determined. The storage capacity of a surface reservoir must be large enough not only to supply the water needed by crops during the irrigation season but also to replace water losses caused by seepage and evaporation. Generally, ½ to 1 acre-foot of stored water is needed for each acre irrigated. A reservoir of smaller capacity can be used if it can be refilled between irrigations.

If the quality of the water is questionable, samples can be sent to the State Soil Testing Laboratory, Agronomy Department, University of Maryland, College Park, Md. This laboratory analyzes water for acidity, salt content, or other harmful characteristics. The runoff water impounded in reservoirs may carry plant diseases that infect susceptible crops if it is used for irrigation. The red stole disease of strawberries, for example, can be transmitted in this way. Runoff water from fields on which strawberries have been grown should not be used to irrigate other fields of strawberries.

Laws and regulations govern the use of water taken from streams and wells. A landowner does not own all of the water in the streams that flow through his land. If he plans to use water from a channelized stream he should obtain information regarding his rights and obligations from a qualified source before investing in irrigation equipment.

and estimates of their physical properties—Continued

Classification—Continued		Percentage passing sieve—			Range in permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 4	No. 10	No. 200				
					Inches per hour	*Inches per inch*	*pH*	
(1)	(1)	(1)	(1)					
(1)	(1)	(1)	(1)					
SM or ML	A-4	100	100	40 to 60	0. 63 to 2. 0	0. 15	4. 5 to 5. 5	Low.
SC or CL	A-4 or A-6	100	100	40 to 60	0. 63 to 2. 0	. 17	4. 5 to 5. 0	Low.
SM, SC, or ML.	A-2 or A-4	100	100	30 to 55	0. 63 to 2. 0	. 15	4. 5 to 5. 5	Low.
SM	A-2	100	100	10 to 20	2. 0 to 6. 3	. 08	4. 5 to 5. 0	Low.

The soils in Somerset County that can be improved by irrigation are placed in groups in table 12 according to characteristics that affect conservation irrigation. The numbers of the irrigation groups are not consecutive, because a statewide system is used in Maryland (*10*), and all irrigation groups in the State are not represented in Somerset County. Many soils in irrigation groups are too wet for cultivation and require artificial drainage. Footnotes in table 12 designate the soils requiring drainage.

Listed in table 12, for each irrigation group, are crops or groups of crops suitable for the soils in the irrigation group. Also given is the estimated rate that water can be safely applied on fields planted to each crop. In addition, table 12 lists the estimated average depth of irrigation needed for each crop and the estimated available moisture in the soils from the surface to that depth. Most of the soils in each group can be irrigated in about the same way. The differences depend mostly on the crop irrigated. The maximum rate of water application applies only if the land irrigated is level or nearly level.

Tomatoes, Irish potatoes, and a few other truck crops are listed separately in table 12, but other truck crops are grouped according to the depth of their rooting and are placed in truck groups 1, 2, and 3. The following lists the crops in each truck group.

Truck Group 1	Truck Group 2	Truck Group 3
Very shallow-rooted crops	*Shallow-rooted crops*	*Moderately deep rooted crops*
Lettuce.	Beets.	Asparagus.
Onions.	Broccoli.	Eggplant.
Spinach.	Cabbage.	Lima beans.
Strawberries.	Cauliflower.	Melons.
	Celery.	Peppers.
	Cucumbers.	Pumpkins.
	Peas.	Squash.
	Snap beans.	

In table 12, grass mixture refers to a mixture of any of several kinds of grasses, with or without legumes, that are grown for pasture or hay. Orchards are of many kinds—apple, peach, pear, cherry, plum, prune, and pecan. An orchard with cover is one that has close-growing crops between the trees. An orchard without cover is one in which the soil between the trees is bare or nearly so.

To be successful, irrigation must meet the needs of both the crop and the soil. Different crops need different amounts of water applied at different intervals and at different rates. Some soils hold much water, and others hold little. Some soils absorb water readily, and others absorb it slowly.

In the following paragraphs the irrigation groups in Somerset County are discussed. Irrigation groups 9 and 13 include most of the best agricultural soils in the county. Water can be applied at a moderate rate to these soils, which can store large amounts. Because the soils in groups 1 and 3 are sandier and have lower water-holding capacity than the soils in groups 9 and 13, water should be applied more frequently, especially if truck crops are grown. In groups 8, 10, 12, and 14, the soils are inextensive and may be so expensive to irrigate that irrigating them for any except special crops may be prohibited.

Irrigation group 1.—In this group are the sandiest farming soils in the county. The soils can be irrigated at a fairly high rate because water infiltrates rapidly. They retain less moisture, however, than the other soils used for agriculture. Irrigation water should be applied frequently and in relatively small amounts.

Irrigation group 3.—The thick, black sandy surface layer of the soils in this group is similar to the surface layer of the soils in group 1, but the subsoil is finer textured and is thin to moderately thick. As a result, these soils hold slightly more moisture to a depth of 18 inches. For most crops, irrigation water should be applied more slowly on these soils. Also, it can be applied at longer intervals.

Irrigation group 8.—The only soil in this group has a crumbly sandy loam surface layer and a tight, slowly permeable subsoil. Fairly large amounts of water can be applied as needed, but after the surface layer is thoroughly wet, the water must be applied slowly. On level or nearly level land, the maximum rate of irrigation ranges from 0.3 inch per hour in clean-cultivated areas to about 0.6 inch per hour where the surface is protected by vegetation. Deep-rooted crops are not well suited to the soil in this group.

TABLE 11.—*Interpretation of*

Soil series and map symbols	Suitability as source of—				Soil features affecting—	
	Topsoil[1]	Sand	Gravel	Road fill	Highway location	Agricultural drainage
Downer (DoA, DoB, DoC, DoC3).	Fair	Locally good.	Locally good.	Fair	Slight frost action; erodible slopes; fair to good stability.	Not needed
Dragston (FdA, FdB, FgA, FgB).	Fair to good.	Locally fair.	Locally fair.	Fair to good.	High water table; severe frost action; erodible slopes; fair to good stability.	Moderate permeability; ditches erodible.
Fallsington (Fa, Fb, FdA, FdB, FgA, FgB).	Good	Locally fair.	Locally fair.	Fair	High water table; severe frost action; erodible slopes; fair to good stability.	Moderately slow permeability; ditches erodible.
Galestown (GcB, GlB, GlC, LgB, LmC).	Fair	Good	Locally good.	Poor	Fair stability	Not needed
Johnston (Jo)	Good [4]	Locally fair.	Unsuitable	Unsuitable	Very high water table; flooding; very severe frost action; very poor stability.	Moderate permeability; ditches erodible; flood hazard.
Keyport (KfA, KmA)	Fair	Unsuitable.	Unsuitable	Fair	Moderately high water table; severe frost action; erodible material; fair stability.	Very slow permeability; ditches erodible; tile impractical.
Klej (KnA, KnB)	Fair	Fair	Unsuitable	Poor	Moderately high water table; moderate frost action; erodible slopes; fair stability.	Rapid to very rapid permeability.
Lakeland (LaB, LgB, LmC, GlB, GlC).	Fair	Good	Locally good.	Poor	Fair stability	Not needed
Leon (Lo)	Poor to fair.	Fair	Unsuitable	Poor	High water table; moderate to severe frost action; erodible material; poor to fair stability.	Rapid to very rapid permeability.
Matapeake (MfA, MfB2, MfC, MkA, MkB2, MkC2, MkC3, MkD).	Good	Locally fair.	Unsuitable	Fair to good.	Moderate frost action; erodible slopes; fair stability.	Not needed
Mattapex (MpA, MpB2, MsA, MsB2).	Good	Locally fair.	Unsuitable	Poor to fair.	Moderately high water table; severe frost action; erodible slopes; fair stability.	Moderately slow permeability; ditches erodible.
Othello (OhA, OhB2, Om, Oo, Os, Ot).	Poor to fair.	Locally fair.	Locally fair.	Poor	High water table; severe frost action; erodible material; poor stability.	Slow permeability; ditches erodible.

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Soil features affecting—Continued					Suitable type of farm pond
Irrigation	Terraces and diversions	Waterways	Dikes, levees, and embankments	Reservoir areas	
Rapid infiltration; low water capacity.	Erodible slopes; fair to good stability.	Low water capacity; low fertility.	Fair to good stability; erodible material; moderate permeability; high maximum density.	Excessive seepage in substratum.	Impounded.
Moderate to rapid infiltration; low to moderate water capacity; poor or somewhat poor drainage.	Erodible slopes; fair to good stability.	Low to moderate water capacity; low fertility.	Fair to good stability; moderate permeability; high maximum density.	Excessive seepage in substratum; high water table.	Excavated or impounded.[2]
Moderate to rapid infiltration; low to moderate water capacity; poor or somewhat poor drainage.	Erodible slopes; fair to good stability.	Low to moderate water capacity; low fertility.	Fair to good stability; moderate permeability; high maximum density.	Excessive seepage in substratum; high water table.	Excavated or impounded.[2]
Very rapid infiltration; very low water capacity.	Erodible slopes; fair stability.	Very low water capacity; very low fertility.	Fair stability; rapid permeability; low maximum density.	High to excessive seepage.	Impounded and excavated.[3]
Moderate infiltration; moderate water capacity; very poor drainage.	Erodible material; very poor stability.	Moderate water capacity; moderate fertility.	Very poor stability; erodible material; moderate permeability; moderate maximum density.	Low to moderate seepage; usually a constant source of water.	Impounded and excavated.
Moderate infiltration; high water capacity; impeded drainage.	Erodible material; fair stability.	High water capacity; low to moderate fertility.	Fair stability; erodible material; very slow permeability; low maximum density.	Very low seepage____	Excavated or impounded.
Rapid infiltration; very low water capacity; impeded drainage.	Erodible slopes; fair stability.	Very low water capacity; very low fertility.	Fair stability; rapid or very rapid permeability; low maximum density.	High seepage; seasonally high water table.	Excavated or impounded.[2]
Very rapid infiltration; very low water capacity.	Erodible slopes; fair stability.	Very low water capacity; very low fertility.	Fair stability; rapid permeability; low maximum density.	High to excessive seepage.	Impounded and excavated.[3]
Rapid infiltration; very low water capacity; somewhat poor or poor drainage.	Erodible material; poor to fair stability.	Very low water capacity; very low fertility.	Poor to fair stability; rapid to very rapid permeability; low maximum density.	High seepage; seasonally high water table.	Excavated.[2]
Moderate infiltration; moderate to high water capacity.	Erodible slopes; fair stability.	Moderate to high water capacity; moderate fertility.	Fair stability; erodible material; moderate permeability; moderate maximum density.	Excessive seepage in substratum.	Impounded.
Moderate infiltration; moderate to high water capacity; impeded drainage.	Erodible slopes; fair stability.	Moderate to high water capacity; moderate fertility.	Fair stability; erodible material; moderately slow permeability; moderate maximum density.	Excessive seepage in substratum.	Impounded.
Moderate infiltration; moderate to high water capacity; poor drainage.	Erodible material; poor stability.	Moderate to high water capacity; low or moderate fertility.	Poor stability; erodible material; slow permeability; low maximum density.	Excess seepage in substratum; high water table.	Excavated or impounded.[2]

TABLE 11.—*Interpretation of*

Soil series and map symbols	Suitability as source of—				Soil features affecting—	
	Topsoil [1]	Sand	Gravel	Road fill	Highway location	Agricultural drainage
Plummer (Pd)	Poor	Fair	Unsuitable	Poor	High water table; moderate frost action; poor stability.	Rapid or very rapid permeability.
Pocomoke (Pk, Pm)	Fair to good.[4]	Locally fair.	Unsuitable	Fair	Very high water table; very severe frost action; erodible material; poor stability.	Moderate permeability
Portsmouth (Po, Pr)	Fair to good.[4]	Locally fair.	Unsuitable	Poor to fair.	Very high water table; very severe frost action; erodible material; poor to very poor stability.	Moderately slow or slow permeability; ditches erodible.
St. Johns (Sa)	Fair [4]	Poor to fair.	Unsuitable	Very poor	Very high water table; severe frost action; very poor stability.	Rapidly or very rapidly permeable.
Sassafras (SfA, SfB2, SfC2, SfC3, SfD).	Good	Locally good.	Locally good.	Good	Moderate frost action; erodible slopes; fair to good stability.	Not needed
Woodstown (WdA, WdB2, WoA, WoB2).	Fair to good.	Locally good.	Locally fair	Fair to good.	Moderately high water table; severe frost action; erodible slopes; fair stability.	Moderate permeability; ditches erodible.

[1] Rating is for surface soil only.
[2] Farm ponds can be excavated on these soils, provided that the sandy substratum is not penetrated or that maintaining the level of pond water appreciably above the natural water table is not necessary.

Irrigation group 9.—The soils in this group have a sandy loam or fine sandy loam plow layer and a somewhat finer textured, moderately permeable subsoil. The moisture-holding capacity is moderate to fairly high. These soils can be irrigated at a moderate rate that ranges from 0.6 inch per hour in clean-cultivated areas to about 1 inch per hour where the surface is protected by vegetation.

Irrigation group 10.—Only one soil in Somerset County is in this group. This soil is poorly drained and may not need irrigation more than once during an extended drought. The rate of water application ranges from about 0.5 inch to 0.8 inch per hour, depending on how well the surface is protected by vegetation. If this soil is used extensively for agriculture, it must be protected from the frequent floods.

Irrigation group 12.—This group consists of medium-textured soils that have a very slowly permeable subsoil. Irrigation water must be applied very slowly. The depth of irrigation required is limited by the tightness and slow permeability of the subsoil.

Irrigation group 13.—This group consists of soils that have a medium-textured surface layer and a somewhat finer textured, moderately permeable subsoil. These soils can be irrigated to a considerable depth, and they hold more moisture than other soils in the county. Because water must be applied at a relatively slow rate, each irrigation takes a comparatively long time. The soils in this group make up more than 40 percent of the county and include many soils that require artificial drainage before they are irrigated.

Irrigation group 14.—This group consists of moderately fine textured soils through which water moves at a fairly slow rate. These soils generally are not cultivated. Only fields planted to grasses are irrigated.

Soil groups for drainage

In this subsection the soils of the county that require artificial drainage have been grouped according to similarity in their requirements for this drainage. The soils in a particular group are similar in their characteristics and in the limitations to use that are caused by drainage. Each group of soils differs from the others in one or more ways, but mainly in the kind and intensity of drainage practices required. Table 13 lists the soils in 17 drainage groups and, for each group, gives the major factors that cause drainage problems, and according to slope, indicates the most practical system or systems for improving drainage. Information in this table was taken

engineering properties of soils—Continued

Soil features affecting—Continued					Suitable type of farm pond
Irrigation	Terraces and diversions	Waterways	Dikes, levees, and embankments	Reservoir areas	
Rapid infiltration; very low water capacity; poor drainage.	Erodible material; poor stability.	Very low water capacity; very low fertility.	Poor stability; rapid or very rapid permeability; low maximum density.	High to excessive seepage; high water table.	Excavated.[2]
Moderate to rapid infiltration; low to moderate water capacity; very poor drainage.	Erodible material; poor stability.	Low to moderate water capacity; low to moderate fertility.	Poor stability; erodible material; moderate permeability; high maximum density.	Excessive seepage in substratum; high water table.	Excavated or impounded.[2]
Moderate infiltration; moderate water capacity; very poor drainage.	Erodible material; poor to very poor stability.	Moderate water capacity; moderate fertility.	Poor or very poor stability; erodible material; moderately slow or slow permeability; low maximum density.	Frequently excessive seepage in substratum; high water table.	Excavated or impounded.[2]
Rapid infiltration; very low water capacity; very poor drainage.	Erodible material; very poor stability.	Very low water capacity; very low fertility.	Very poor stability; rapid permeability; low maximum density.	High to excessive seepage; very high water table.	Excavated.[2]
Moderate infiltration; moderate water capacity.	Erodible slopes; fair to good stability.	Moderate water capacity; moderate fertility.	Fair to good stability; erodible material; moderate permeability; high maximum density.	Excessive seepage in substratum.	Impounded.
Moderate to rapid infiltration; low to moderate water capacity; impeded drainage.	Erodible slopes; fair stability.	Low to moderate water capacity; low to moderate fertility.	Fair stability; erodible material; moderate permeability; high maximum density.	Excessive seepage in substratum.	Excavated or impounded.[2]

[3] In many places constructing farm ponds on these soils is not feasible. If farm ponds are constructed, they may be excavated or impounded, or preferably both. Because excessive losses of water by seepage can be expected, special chemical, physical, or biological treatment is generally needed.

[4] Surface layer contains moderate to very large amounts of organic matter, and rating applies only where organic topsoil is desirable.

from the "Drainage Guide for Maryland Coastal Plain" (*9*).

Table 13 is not intended as a technical guide for solving all the drainage problems that arise in the county. It does, however, show the farmer and the drainage engineer what to expect on the soils that require drainage.

For a particular farm, field, or other area, the details of a specific drainage system should be worked out on the site. In any system the spacing and the depth of the drains depend mainly on the degree of wetness, the texture of the soils, and the permeability of the surface layer and the subsoil. The depth of the ditches, or the gradient of the tile lines, largely depends on the nature of the subsoil and the substratum. It is particularly important to know whether the substratum is loose sand or gravel, is clay, or is between these extremes.

In an area that is nearly level and sloping, open ditches can be used in the nearly level places, and diversions on the stronger slopes. For other areas, open field drains or V-type ditches may be suitable and bedding may be desirable, especially between V-type ditches. Some areas can be drained by using a random system of tiling, that is, one in which tile in the natural water courses and extra branch lines are laid in wet areas as needed. In other areas, where the soils are uniformly too wet for cultivation, a complete system of tile drainage is needed, and the tile are laid in a definite pattern throughout the wet area.

Nonfarm Uses of Soils

Somerset County, traditionally an agricultural area, is in the densely populated urban-suburban belt that extends from the vicinity of Norfolk and Richmond, Va., to Boston, Mass., and beyond. In most parts of this belt population is growing, and suburban areas are spreading rapidly. This growth and spread is expected to continue and to directly affect Somerset County. An initial effect of the growth is the increasing demand for information about soil conditions that influence nonfarm uses. The most urgent need has been for information about the limitations of soil areas for disposing sewage effluent from septic tanks. Less urgent have been requests for information about the limitations of soils if used in building foundations, in earth moving, in landscaping, in streets and parking lots, in recreation areas, and the like.

Table 14 rates the limitations of each soil in the county as *slight*, *moderate*, or *severe* according to the degree that the soil is limited in its specified nonfarm uses. A rating of slight may include no limitations, though few soils in

TABLE 12.—*Irrigation groups of soils, suitable crops, irrigation requirements, and available moisture*

Irrigation group and soils	Suitable crops	Estimated maximum rate water can be applied on level and nearly level land [1]	Estimated average depth of irrigation	Estimated average available moisture to depth of irrigation
		Inches per hr.	*Inches*	*Inches*
Group 1: Somewhat excessively drained to poorly drained, very deep sands and loamy sands.	Truck group 1	1.0	18	1.5
Galestown loamy sand, clayey substratum, 0 to 5 percent slopes.	Truck group 2	1.0	24	2.0
Galestown-Lakeland sands, 0 to 5 percent slopes.	Truck group 3	1.0	30	2.5
Galestown-Lakeland sands, 5 to 10 percent slopes.	Corn	1.0	27	2.3
Klej loamy sand, 0 to 2 percent slopes.[2]	Sweet corn	1.0	24	2.0
Klej loamy sand, 2 to 5 percent slopes.[2]	Soybeans	1.0	24	2.0
Lakeland loamy sand, clayey substratum, 0 to 5 percent slopes.	Alfalfa	1.0	36	3.0
Lakeland-Galestown loamy sands, clayey substratum, 2 to 5 percent slopes.	Irish potatoes	1.0	24	2.0
Lakeland-Galestown loamy sands, 5 to 10 percent slopes.	Sweetpotatoes	1.0	24	2.0
Leon loamy sand.[3]	Tomatoes	1.0	27	2.3
Plummer loamy sand.[4]	Orchard with cover	1.0	36	3.0
St. Johns loamy sand.[5]	Orchard without cover	1.0	36	3.0
	Grass mixture	1.0	24	2.0
Group 3: Well-drained loamy sands underlain by sandy loam or sandy clay loam at a depth of about 18 inches.	Truck group 1	.9	18	1.5
Downer loamy sand, 0 to 2 percent slopes.	Truck group 2	.9	18	1.5
Downer loamy sand, 2 to 5 percent slopes.	Truck group 3	.9	18	1.5
Downer loamy sand, 5 to 10 percent slopes.	Corn	.9	27	2.8
Downer loamy sand, 5 to 10 percent slopes, severely eroded.	Sweet corn	.9	24	2.5
	Soybeans	.9	24	2.5
	Alfalfa	1.0	27	2.8
	Irish potatoes	.9	18	1.5
	Sweetpotatoes	.9	18	1.5
	Tomatoes	.9	27	2.8
	Orchard with cover	1.0	27	2.8
	Orchard without cover	.9	27	2.8
	Grass mixture	1.0	24	2.5
Group 8: Moderately coarse textured soil that has a fine-textured, slowly permeable subsoil.	Truck group 1	.3	12	1.7
Keyport fine sandy loam, 0 to 2 percent slopes.[2]	Truck group 2	.3	15	2.2
	Truck group 3	.3	18	2.7
	Corn	.3	20	3.0
	Sweet corn	.3	20	3.0
	Soybeans	.3	20	3.0
	Tomatoes	.3	20	3.0
	Grass mixture	.6	20	3.0
Group 9: Moderately coarse textured soils that have a moderately permeable sandy loam to silty clay loam subsoil.	Truck group 1	.6	12	1.7
Fallsington sandy loam.[4]	Truck group 2	.6	15	2.2
Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes.[4]	Truck group 3	.6	18	2.7
Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes.[4]	Corn	.6	24	3.7
Matapeake fine sandy loam, 0 to 2 percent slopes.	Sweet corn	.6	18	2.7
Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded.	Soybeans	.6	18	2.7
Matapeake fine sandy loam, 5 to 10 percent slopes.	Alfalfa	1.0	27	4.2
Mattapex fine sandy loam, 0 to 2 percent slopes.[2]	Irish potatoes	.6	18	2.7
Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded.[2]	Sweetpotatoes	.6	18	2.7
Pocomoke sandy loam.[5]	Tomatoes	.6	24	3.7
Sassafras sandy loam, 0 to 2 percent slopes.	Orchard with cover	1.0	27	4.2
Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded.	Orchard without cover	.6	27	4.2
Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded.	Grass mixture	1.0	18	2.7
Sassafras sandy loam, 5 to 10 percent slopes, severely eroded.				
Sassafras sandy loam, 10 to 15 percent slopes.				
Woodstown sandy loam, 0 to 2 percent slopes.[2]				
Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.[2]				

See footnotes at end of table.

TABLE 12.—*Irrigation groups of soils, suitable crops, irrigation requirements, and available moisture*—Continued

Irrigation group and soils	Suitable crops	Estimated maximum rate water can be applied on level and nearly level land [1]	Estimated average depth of irrigation	Estimated average available moisture to depth of irrigation
		Inches per hr.	*Inches*	*Inches*
Group 10: Soil that is medium-textured to a depth of about 36 inches or more.	Truck group 1	0.5	12	2.0
Johnston loam.[5]	Truck group 2	.5	15	2.5
	Truck group 3	.5	18	3.0
	Corn	.5	24	4.0
	Sweet corn	.5	18	3.0
	Soybeans	.5	18	3.0
	Tomatoes	.5	24	4.0
	Grass mixture	.8	18	3.0
Group 12: Medium-textured soils that have a fine-textured, slowly permeable subsoil.	Truck group 1	.3	12	2.0
Keyport silt loam, 0 to 2 percent slopes.[2]	Truck group 2	.3	15	2.5
Portsmouth loam.[5]	Truck group 3	.3	18	3.0
Portsmouth silt loam.[5]	Corn	.3	18	3.0
	Sweet corn	.3	18	3.0
	Soybeans	.3	18	3.0
	Tomatoes	.3	18	3.0
	Grass mixture	.5	18	3.0
Group 13: Medium-textured soils that have a moderately permeable sandy loam to silty clay loam subsoil.	Truck group 1	.4	12	2.0
Fallsington loam.[4]	Truck group 2	.4	15	2.5
Fallsington and Dragston loams, 0 to 2 percent slopes.	Truck group 3	.4	18	3.0
Fallsington and Dragston loams, 2 to 5 percent slopes.[4]	Corn	.4	24	4.0
Matapeake silt loam, 0 to 2 percent slopes.	Sweet corn	.4	18	3.0
Matapeake silt loam, 2 to 5 percent slopes, moderately eroded.	Soybeans	.4	18	3.0
Matapeake silt loam, 5 to 10 percent slopes, moderately eroded.	Alfalfa	.7	27	4.5
Matapeake silt loam, 5 to 10 percent slopes, severely eroded.	Irish potatoes	.4	18	3.0
Matapeake silt loam, 10 to 15 percent slopes.	Sweetpotatoes	.4	18	3.0
Mattapex silt loam, 0 to 2 percent slopes.[2]	Tomatoes	.4	24	4.0
Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.[2]	Orchard with cover	.7	27	4.5
Othello silt loam, 0 to 2 percent slopes.[4]	Orchard without cover	.4	27	4.5
Othello silt loam, 2 to 5 percent slopes, moderately eroded.[4]	Grass mixture	.7	18	3.0
Othello silt loam, silty substratum.[4]				
Pocomoke loam.[5]				
Woodstown loam, 0 to 2 percent slopes.[2]				
Woodstown loam, 2 to 5 percent slopes, moderately eroded.[2]				
Group 14: Moderately fine textured soils that have slow infiltration and a slowly permeable subsoil.	Grass mixture	.5	18	3.0
Othello silty clay loam.[4]				
Othello silty clay loam, silty substratum.[4]				

[1] Sloping soils do not need to be leveled in order to use sprinkler irrigation, but on those soils a rate of application greater than that given in this table has to be used.

[2] Soil is only moderately well drained and requires artificial drainage before it is suitable for irrigation.

[3] Soil is somewhat poorly drained or poorly drained and requires artificial drainage before it is suitable for irrigation.

[4] Soil is poorly drained and requires artificial drainage before it is suitable for irrigation.

[5] Soil is very poorly drained and requires artificial drainage before it is suitable for irrigation.

the county have no limitations for a particular urban or suburban use.

The ratings are based on the degree of the greatest single limitation. If flooding severely limits a soil in the disposal of sewage effluent from septic tanks, the limitations are rated severe for that use, though the soil, in all other respects, is suitable for disposing effluent.

A rating of severe for a particular use does not mean that a soil so rated cannot be put to that use. For example, limitations rated severe for a soil used as an athletic field do not rule out that use if the building of levees to protect the soil is economically feasible. Likewise, a wet soil with a high water table may be severely limited in its use for cemeteries and still be used for them, if measures are taken to drain the soil or to lower the water table. Severe limitations to use of a soil as foundations for homes may be caused by a wet, plastic, unstable substratum, but these limitations do not prohibit using the soil for foundations if it can be drained and stabilized without too much expense.

TABLE 13.—*Drainage soil groups and suggested kinds of drainage systems*

Soil group and included soils	Major problems	Slope range	Kind of drain [1]	Remarks
		Percent		
Drainage group 2–A: Moderately well drained soils that have a moderately fine textured subsoil and a sandy substratum. (MpA) Mattapex fine sandy loam, 0 to 2 percent slopes. (MpB2) Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded. (MsA) Mattapex silt loam, 0 to 2 percent slopes. (MsB2) Mattapex silt loam, 2 to 5 percent slopes, moderately eroded. (WdA) Woodstown loam, 0 to 2 percent slopes. (WdB2) Woodstown loam, 2 to 5 percent slopes, moderately eroded.	Seasonal high water table for short periods and impeded drainage in the lower part of the subsoil.	0 to 2	Tile in a random or a patterned system; field ditches.	Land smoothing may be necessary.
		2 to 5	Tile in a random or a patterned system; diversions.	Reduce spacing between diversions and add waterways for control of erosion in sloping areas; use diversions for interceptors.
Drainage group 2–B: Moderately well drained soils that have a moderately fine textured subsoil and a sandy substratum. (WoA) Woodstown sandy loam, 0 to 2 percent slopes. (WoB2) Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.	Seasonal high water table for short periods and impeded drainage in the lower part of the subsoil.	0 to 2	Tile in a random or a patterned system; field ditches.	Land smoothing may be necessary.
		2 to 5	Tile in a random or a patterned system; diversions.	Boundary drainage may be practical.
Drainage group 4: Moderately well drained soils that have a subsoil of sand or loamy sand. (KnA) Klej loamy sand, 0 to 2 percent slopes. (KnB) Klej loamy sand, 2 to 5 percent slopes.	High, fluctuating water table for fairly long periods.	0 to 2	Tile in a random system; interceptor ditches.	Interceptor tile may be used with diversions; spacing varies with width of strips and may be reduced where needed to control erosion.
		2 to 5	Tile in a random system; diversions.	
Drainage group 6–2A: Moderately well drained silty soil that has a tight clayey subsoil. (KmA) Keyport silt loam, 0 to 2 percent slopes.	Impeded subsoil drainage and a high perched water table for long periods.	0 to 2	Field ditches; random ditches.	Land smoothing may be necessary.
Drainage group 6–2B: Moderately well drained sandy soil that has a tight clayey subsoil. (KfA) Keyport fine sandy loam, 0 to 2 percent slopes.	Impeded subsoil drainage and a high perched water table for long periods.	0 to 2	Field ditches; random ditches.	Land smoothing may be necessary; graded rows may be used.
Drainage group 7–A: Poorly drained soils that have a medium-textured surface layer, a sandy clay loam subsoil, and a sandy substratum. (Fa) Fallsington loam. (FgA) Fallsington and Dragston loams, 0 to 2 percent slopes. (FgB) Fallsington and Dragston loams, 2 to 5 percent slopes.	Long periods of high water table.	0 to 2	Tile in a patterned system; field ditches.	Tile may be used to intercept seepage from higher areas.
		2 to 5	Tile in a patterned system; diversions.	Boundary drainage and graded rows may be practical.
Drainage group 7–B: Poorly drained soils that have a moderately coarse textured surface soil, a sandy clay loam subsoil, and a sandy substratum. (Fb) Fallsington sandy loam. (FdA) Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes. (FdB) Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes.	Long periods of high water table.	0 to 2	Tile in a patterned system; field ditches.	Tile may be used to intercept seepage from higher areas.
		2 to 5	Tile in a patterned system; diversions.	Use boundary drainage and graded rows.

TABLE 13.—*Drainage soil groups and suggested kinds of drainage systems*—Continued

Soil group and included soils	Major problems	Slope range	Kind of drain [1]	Remarks
		Percent		
Drainage group 8–1A: Poorly drained, medium-textured soils that have a silty clay loam subsoil.	Long periods of high water table.	0 to 2	Field ditches	Land smoothing may be necessary; graded rows may be used.
(OhA) Othello silt loam, 0 to 2 percent slopes. (OhB2) Othello silt loam, 2 to 5 percent slopes, moderately eroded. (Oo) Othello silt loam, silty substratum.		2 to 5	Field ditches; diversions.	Boundary drainage and graded rows may be practical.
Drainage group 8–2A: Poorly drained, moderately fine textured soils that have a silty clay loam subsoil. (Os) Othello silty clay loam. (Ot) Othello silty clay loam, silty substratum.	Long periods of high water table.	0 to 2	Field ditches	Soils not used for cultivated crops in many places.
Drainage group 9 1A: Poorly drained soil that is loamy sand or sand throughout. (Pd) Plummer loamy sand.	Long periods of high or very high water table.	0 to 2	Tile in a patterned system; field ditches.	Possible overdrainage in dry seasons.
Drainage group 9–2B: Poorly drained and very poorly drained very sandy soils that have an organic hardpan in the subsoil. (Lo) Leon loamy sand. (Sa) St. Johns loamy sand.	Long periods of high or very high water table.	0 to 2	V-type ditches; field ditches.	Depth of ditches may depend on depth to cemented hardpan.
Drainage group 9–3A: Very poorly drained, medium-textured soil that has a sandy clay loam subsoil and a sandy substratum. (Pk) Pocomoke loam.	Long or very long periods of high or very high water table.	0 to 2	Random tile; field ditches.	Bedding may be needed between open drains.
Drainage group 9–3B: Very poorly drained, moderately coarse textured soil that has a sandy clay loam subsoil and a sandy substratum. (Pm) Pocomoke sandy loam.	Long or very long periods of high or very high water table.	0 to 2	Field ditches	Bedding may be needed between open drains.
Drainage group 9–4A: Very poorly drained, medium-textured soils that have a silty clay loam subsoil and a sandy substratum. (Po) Portsmouth loam. (Pr) Portsmouth silt loam.	Long or very long periods of high or very high water table.	0 to 2	V-type ditches; field ditches.	Bedding advisable for row crops.
Drainage group 10: Poorly drained, medium-textured soil that has a silty clay loam subsoil. (Om) Othello silt loam, low.	Long periods of high water table; tidal overflow.	0 to 2	V-type ditches; field ditches.	Use dikes where feasible; soil not used for row crops.
Drainage group 11–A: Very poorly drained, medium-textured soil on flood plains. (Jo) Johnston loam.	Flooding; very long periods of very high water table.	0 to 2	V-type ditches; tile interceptors; field ditches.	Dikes, floodgates, or both, may be feasible.
Drainage group 12: Miscellaneous and unclassified soils on flood plains. (Mx) Mixed alluvial land.	Flooding and other drainage problems.	0 to 2	V-type ditches	Land not used for cultivated crops.

[1] Field ditches referred to in this column have side slopes steeper than those with a 1-foot vertical rise for every 2 feet of horizontal distance. V-type drains are designed for intermittent flow and to permit the crossing of farm machines. They have side slopes more nearly flat than those with a 1-foot vertical rise for every 3 feet of horizontal distance.

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TABLE 14.—*Limitations*

[Gravel and borrow pits (Gp) and Made land (Ma)

Map symbol	Soils	Degree and kind of limitation for— Disposal of sewage effluent from septic tanks	Sewage lagoons	Foundations for homes of two stories or less	Landscaping and earth moving
Cb	Coastal beaches.	Severe; tidal flooding.	Severe; tidal flooding and rapid permeability.	Severe; loose material; little stability.	Slight.
DoA	Downer loamy sand, 0 to 2 percent slopes.	Slight.	Slight.	Slight.	Slight.
DoB	Downer loamy sand, 2 to 5 percent slopes.	Slight.	Moderate; 2 to 5 percent slopes.	Slight.	Slight.
DoC DoC3	Downer loamy sand, 5 to 10 percent slopes. Downer loamy sand, 5 to 10 percent slopes, severely eroded.	Moderate; 5 to 10 percent slopes.	Severe; 5 to 10 percent slopes.	Slight.	Slight.
Fa Fb FdA FgA	Fallsington loam. Fallsington sandy loam. Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes. Fallsington and Dragston loams, 0 to 2 percent slopes.	Severe; high water table.	Slight; probable seepage.	Severe; high water table.	Severe; high water table.
FdB FgB	Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes. Fallsington and Dragston loams, 2 to 5 percent slopes.	Severe; high water table.	Moderate; 2 to 5 percent slopes; probable seepage.	Severe; high water table.	Severe; high water table.
GcB GlB	Galestown loamy sand, clayey substratum, 0 to 5 percent slopes. Galestown-Lakeland sands, 0 to 5 percent slopes.	Slight; risk of polluting shallow wells nearby.	Severe; rapid permeability.	Moderate; loose material; difficult to compact.	Slight.
GlC	Galestown-Lakeland sands, 5 to 10 percent slopes.	Slight; risk of polluting shallow wells nearby.	Severe; rapid permeability.	Moderate; loose material; difficult to compact.	Slight.
Jo	Johnston loam.	Severe; flooding; high water table.	Severe; flooding; excessive organic material.	Severe; flooding; high water table.	Severe; high water table.
KfA KmA	Keyport fine sandy loam, 0 to 2 percent slopes. Keyport silt loam, 0 to 2 percent slopes.	Severe; slow permeability; seasonally high water table.	Slight.	Moderate; seasonally high water table.	Moderate; seasonally high water table.
KnA KnB	Klej loamy sand, 0 to 2 percent slopes. Klej loamy sand, 2 to 5 percent slopes.	Moderate; seasonally high water table.	Severe; rapid permeability.	Moderate; seasonally high water table.	Moderate; seasonally high water table.
LaB LgB	Lakeland loamy sand, clayey substratum, 0 to 5 percent slopes. Lakeland-Galestown loamy sands, clayey substratum, 2 to 5 percent slopes.	Slight; risk of polluting shallow wells nearby.	Severe; rapid permeability.	Moderate; loose material; difficult to compact.	Slight.
LmC	Lakeland-Galestown loamy sands, 5 to 10 percent slopes.	Slight; risk of polluting shallow wells nearby.	Severe; rapid permeability.	Moderate; loose material; difficult to compact.	Slight.
Lo	Leon loamy sand.	Severe; high water table.	Severe; rapid permeability.	Severe; high water table.	Severe; high water table.
MfA MkA	Matapeake fine sandy loam, 0 to 2 percent slopes. Matapeake silt loam, 0 to 2 percent slopes.	Slight.	Slight.	Slight.	Slight.
MfB2 MkB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded. Matapeake silt loam, 2 to 5 percent slopes, moderately eroded.	Slight.	Moderate; 2 to 5 percent slopes.	Slight.	Slight.

of soils for nonfarm uses

are not rated, because they are highly variable]

Degree and kind of limitation for—Continued					
Streets and parking lots	Athletic fields	Parks and extensive play areas	Fill for sanitary uses	Cemeteries	Home gardens
Moderate; loose material; difficult to compact.	Severe; sodding difficult; very poor stability.	Severe; sodding difficult; very poor stability.	Moderate; loose material; difficult to compact.	Severe; risk of tidal flooding.	Severe; droughtiness; low fertility; risk of tidal flooding.
Slight	Slight	Slight	Slight	Slight	Slight.
Moderate; 2 to 5 percent slopes.	Moderate; 2 to 5 percent slopes.	Slight	Slight	Slight	Moderate; 2 to 5 percent slopes.
Moderate; 5 to 10 percent slopes.	Moderate; 5 to 10 percent slopes.	Slight	Slight	Slight	Severe; 5 to 10 percent slopes.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Severe; high water table.	Severe; high water table.	Severe; high water table.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Severe; high water table.	Severe; high water table.	Severe; high water table.
Moderate; loose material; difficult to compact.	Moderate; loose material; sodding difficult.	Moderate; loose material; sodding difficult.	Moderate; loose material; difficult to compact.	Slight	Severe; droughtiness; low fertility.
Moderate; 5 to 10 percent slopes; loose material.	Severe; 5 to 10 percent slopes; sodding difficult.	Moderate; loose material; sodding difficult.	Moderate; loose material; difficult to compact.	Slight	Severe; droughtiness low fertility.
Severe; flooding; high water table.	Severe; high water table; flooding.	Severe; high water table.	Severe; excessive organic material.	Severe; flooding; high water table.	Severe; high water table.
Moderate; seasonally high water table.	Severe; slow permeability; seasonally high water table.	Moderate; seasonally high water table.	Severe; sticky material; seasonally high water table.	Severe; slow permeability; seasonally high water table.	Moderate; seasonally high water table.
Moderate; loose material; seasonally high water table.	Moderate; loose material; seasonally high water table.	Moderate; loose material; seasonally high water table.	Slight	Moderate; seasonally high water table.	Severe; seasonally high water table; low fertility.
Moderate; loose material; difficult to compact.	Moderate; loose material; difficult to sod.	Moderate; loose material; sodding difficult.	Moderate; loose material; difficult to compact.	Slight	Severe; droughtiness; low fertility.
Moderate; 5 to 10 percent slopes; loose material.	Severe; 5 to 10 percent slopes; sodding difficult.	Moderate; loose material; sodding difficult.	Moderate; loose material; difficult to compact.	Slight	Severe; droughtiness; low fertility.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Moderate; hardpan layer.	Severe; high water table.	Severe; high water table.
Slight	Slight	Slight	Slight	Slight	Slight.
Moderate; 2 to 5 percent slopes.	Moderate; 2 to 5 percent slopes.	Slight	Slight	Slight	Moderate; 2 to 5 percent slopes.

TABLE 14.—*Limitations*

Map symbol	Soils	Degree and kind of limitation for—			
		Disposal of sewage effluent from septic tanks	Sewage lagoons	Foundations for homes of two stories or less	Landscaping and earth moving
MfC MkC2 MkC3	Matapeake fine sandy loam, 5 to 10 percent slopes. Matapeake silt loam, 5 to 10 percent slopes, moderately eroded. Matapeake silt loam, 5 to 10 percent slopes, severely eroded.	Moderate; 5 to 10 percent slopes.	Severe; 5 to 10 percent slopes.	Slight	Slight
MkD	Matapeake silt loam, 10 to 15 percent slopes.	Moderate; 10 to 15 percent slopes.	Severe; 10 to 15 percent slopes.	Moderate; 10 to 15 percent slopes.	Moderate; 10 to 15 percent slopes.
MpA MsA	Mattapex fine sandy loam, 0 to 2 percent slopes. Mattapex silt loam, 0 to 2 percent slopes.	Severe; moderately slow permeability; seasonally high water table.	Slight	Moderate; seasonally high water table.	Moderate; seasonally high water table.
MpB2 MsB2	Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded. Mattapex silt loam, 2 to 5 percent slopes, moderately eroded.	Severe; moderately slow permeability; seasonally high water table.	Moderate; 2 to 5 percent slopes.	Moderate; seasonally high water table.	Moderate; seasonally high water table.
Mx	Mixed alluvial land.	Severe; flooding; high water table.	Severe; flooding	Severe; high water table.	Severe; high water table.
My	Muck and peat.	Severe; high water table.	Severe; highly organic material.	Severe; high water table; highly organic material.	Severe; high water table; highly organic material.
OhA Oo Os Ot	Othello silt loam, 0 to 2 percent slopes. Othello silt loam, silty substratum. Othello silty clay loam. Othello silty clay loam, silty substratum.	Severe; high water table.	Slight	Severe; high water table.	Severe; high water table.
OhB2	Othello silt loam, 2 to 5 percent slopes, moderately eroded.	Severe; high water table.	Moderate; 2 to 5 percent slopes.	Severe; high water table.	Severe; high water table.
Om	Othello silt loam, low.	Severe; high water table.	Severe; flooding	Severe; high water table.	Severe; high water table.
Pd	Plummer loamy sand.	Severe; high water table.	Severe; rapid permeability.	Severe; high water table.	Severe; high water table.
Pk Pm	Pocomoke loam. Pocomoke sandy loam.	Severe; high water table.	Severe; highly organic material.	Severe; high water table.	Severe; high water table.
Po Pr	Portsmouth loam. Portsmouth silt loam.	Severe; high water table.	Severe; highly organic material.	Severe; high water table.	Severe; high water table.
Sa	St. Johns loamy sand.	Severe; high water table.	Severe; rapid permeability.	Severe; high water table.	Severe; high water table.
SfA	Sassafras sandy loam, 0 to 2 percent slopes.	Slight	Slight	Slight	Slight
SfB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded.	Slight	Moderate; 2 to 5 percent slopes.	Slight	Slight
SfC2 SfC3	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded. Sassafras sandy loam, 5 to 10 percent slopes, severely eroded.	Moderate; 5 to 10 percent slopes.	Severe; 5 to 10 percent slopes.	Slight	Slight
SfD	Sassafras sandy loam, 10 to 15 percent slopes.	Moderate; 10 to 15 percent slopes.	Severe; 10 to 15 percent slopes.	Moderate; 10 to 15 percent slopes.	Moderate; 10 to 15 percent slopes.

of soils for nonfarm uses—Continued

Degree and kind of limitation for—Continued					
Streets and parking lots	Athletic fields	Parks and extensive play areas	Fill for sanitary uses	Cemeteries	Home gardens
Moderate; 5 to 10 percent slopes.	Moderate; 5 to 10 percent slopes.	Slight	Slight	Slight	Severe; 5 to 10 percent slopes.
Severe; 10 to 15 percent slopes.	Severe; 10 to 15 percent slopes.	Slight	Slight	Slight	Very severe; 10 to 15 percent slopes.
Moderate; seasonally high water table.	Severe; moderately slow permeability; seasonally high water table.	Moderate; seasonally high water table.	Moderate; moderately well drained.	Severe; seasonally high water table.	Moderate; seasonally high water table.
Moderate; seasonally high water table.	Severe; moderately slow permeability; seasonally high water table.	Moderate; seasonally high water table.	Moderate; moderately well drained.	Severe; seasonally high water table.	Moderate; seasonally high water table.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Slight	Severe; high water table.	Severe; high water table.
Severe; high water table; highly organic material.	Severe; high water table; highly organic material.	Severe; high water table.	Severe; highly organic material.	Severe; high water table; highly organic material.	Severe; high water table.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Moderate; sticky material.	Severe; high water table.	Severe; high water table.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Moderate; sticky material.	Severe; high water table.	Severe; high water table.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Moderate; sticky material.	Severe; high water table.	Severe; high water table; flooding.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Slight	Severe; high water table.	Severe; high water table.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Severe; highly organic material.	Severe; high water table.	Severe; high water table.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Severe; highly organic material.	Severe; high water table.	Severe; high water table.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Severe; highly organic material.	Severe; high water table.	Very severe; high water table; very low fertility.
Slight	Slight	Slight	Slight	Slight	Slight.
Moderate; 2 to 5 percent slopes.	Moderate; 2 to 5 percent slopes.	Slight	Slight	Slight	Moderate; 2 to 5 percent slopes.
Moderate; 5 to 10 percent slopes.	Moderate; 5 to 10 percent slopes.	Slight	Slight	Slight	Severe; 5 to 10 percent slopes.
Severe; 10 to 15 percent slopes.	Severe; 10 to 15 percent slopes.	Slight	Slight	Slight	Very severe; 10 to 15 percent slopes.

TABLE 14.—*Limitations*

Map symbol	Soils	Degree and kind of limitation for—			
		Disposal of sewage effluent from septic tanks	Sewage lagoons	Foundations for homes of two stories or less	Landscaping and earth moving
St	Steep sandy land.	Severe; steep slopes	Severe; steep slopes	Severe; steep slopes	Severe; steep slopes.
Sw	Swamp.	Severe; high water table.	Severe; highly organic material.	Severe; high water table.	Severe; high water table.
Tm	Tidal marsh.	Severe; high water table; tidal flooding.	Severe; tidal flooding.	Severe; high water table; tidal flooding.	Severe; high water table; tidal flooding.
WdA WoA	Woodstown loam, 0 to 2 percent slopes. Woodstown sandy loam, 0 to 2 percent slopes.	Severe; moderately slow permeability; seasonally high water table.	Slight	Moderate; seasonally high water table.	Moderate; seasonally high water table.
WdB2 WoB2	Woodstown loam, 2 to 5 percent slopes, moderately eroded. Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded.	Severe; moderately slow permeability; seasonally high water table.	Moderate; 2 to 5 percent slopes.	Moderate; seasonally high water table.	Moderate; seasonally high water table.

The following lists the properties that limit the soils of the county in their suitability for each use specified in table 14.

Disposal of sewage effluent from septic tanks: Permeability of the soil, depth to a seasonally high water table, hazard of flooding (fig. 21), depth to bedrock, and steepness of slope.

Sewage lagoons: Permeability of the soil, depth to bedrock or other impervious layers, steepness of slope, hazard of flooding, and organic-matter content.

Foundations for homes of two stories or less: Depth to water table, steepness of slope, depth to bedrock if basement is 6 feet or more below the surface, hazard of flooding, and texture of the surface soil. (For buildings of more than 2 stories, investigation should be made on the site).

***Figure 21.*—The septic tank of this house on Fallsington soils is flooded in winter and cannot function.**

Landscaping and earth moving: Texture of the surface layer and subsoil, plasticity of the subsoil and substratum, wetness, height of water table, susceptibility to frost action, limitations to working the soil when it is wet or frozen, and depth to hard bedrock.

Streets and parking lots: Depth to water table, steepness of slope, depth to bedrock if it is to be removed, and hazard of flooding.

Athletic fields: Depth to water table, steepness of slope, depth to bedrock, texture of the surface layer, and hazard of flooding.

Parks and extensive play areas: The same kinds of factors limit the use of soils for parks and extensive play areas as limit use for athletic fields, but the degree of limitation differs. A park used for picnics or as a general playground does not need to be so level and uniformly smooth as a football field. Also, for parks and extensive play areas, the depth to bedrock is not so important.

Fill for sanitary uses: Texture of the material, plasticity, organic-matter content, and depth to bedrock or thickness of the suitable soil material.

Cemeteries: Depth to water table, hazard of flooding (fig. 22), depth to bedrock or cemented layers, plasticity of the surface layer and subsoil, and steepness of slope.

Home gardens: Texture of the surface layer, permeability of the subsoil, steepness of slope, available moisture capacity, depth to water table, natural drainage, depth to bedrock or other impervious layer.

Use of the soil survey in community planning

In planning uses for different parts of a proposed community, and in carrying out these plans, a knowledge of the different soils in the proposed area is needed so that the soils can be put to uses most suitable for them. As a rule, the soils that are best for agriculture are the

of soils for nonfarm uses—Continued

Degree and kind of limitation for—Continued					
Streets and parking lots	Athletic fields	Parks and extensive play areas	Fill for sanitary uses	Cemeteries	Home gardens
Severe; steep slopes	Severe; steep slopes	Moderate; steep slopes.	Slight	Severe; steep slopes.	Very severe; steep slopes.
Severe; high water table.	Severe; high water table.	Severe; high water table.	Severe; highly organic material.	Severe; high water table.	Very severe; high water table.
Severe; high water table; tidal flooding.	Severe; high water table; tidal flooding.	Severe; high water table; tidal flooding.	Severe; highly organic material.	Severe; high water table; tidal flooding.	Very severe; high water table; tidal flooding.
Moderate; seasonally high water table.	Severe; moderately slow permeability; seasonally high water table.	Moderate; seasonally high water table.	Moderate; seasonally high water table.	Severe; seasonally high water table.	Moderate; seasonally high water table.
Moderate; seasonally high water table.	Severe; moderately slow permeability; seasonally high water table.	Moderate; seasonally high water table.	Moderate; seasonally high water table.	Severe; seasonally high water table.	Moderate; seasonally high water table.

ones that are also suitable for building sites. To prevent using the best agricultural soils for nonfarm uses, the plan of land use adopted should reserve the most fertile soils for agriculture.

In Somerset County the soils that are best suited for agriculture without artificial drainage are the Downer, Matapeake, and Sassafras, particularly areas of those soils that have slopes of not more than 5 percent. Many other soils in the county are also good for agriculture if they are adequately drained. The agricultural uses of soils are discussed in the section "Use and Management of the Soils."

Table 14 shows that limitations to disposing of effluent from septic tanks are slight on Downer, Galestown, Lakeland, Matapeake, and Sassafras soils having slopes of 0 to 5 percent and on the Galestown and Lakeland soils having slopes of 5 to 10 percent. That rating applies only to areas of those soils where the density of housing is low. Only those soils, therefore, are suitable for homes in places where a community sewage system is not planned and the disposal of sewage is to be through septic tanks. If homesites are planned in areas of all other soils in the county, a community system of disposing sewage is needed, or special means of disposal must be used.

Figure 22.—Graves placed on top of the ground at Marines Church in Crisfield because the water table is normally high and flooding is likely when tides are extremely high.

In any community, land is needed for recreational areas. The nearly level Downer, Matapeake, and Sassafras soils have only slight limitations to use for athletic fields and other nearly level play areas. The more strongly sloping or steep areas of those soils are excellent for parks and other recreational areas in which nearly level land is not needed. Many areas of these strongly sloping or steep soils are still wooded and probably should be kept in trees. Neither the steep hillsides nor the narrow bottom lands that lie below them are well suited for use as farms or as building lots, but together these areas may be used for general recreation.

Artificial ponds are also important for recreation. The type of farm pond—excavated or impounded—that is suitable for each soil in the county is named in table 11, in the subsection "Engineering Uses of the Soils." Table 11 also names soil features that affect the building and maintenance of the embankments and the reservoir areas of ponds and other areas of water.

Formation and Classification of Soils

This section consists of four main parts. In the first part the factors of soil formation are discussed as they relate to the formation of soils in Somerset County. The second part discusses the morphology of the soils in the county. In the third part each soil series represented in

the county is placed in its respective family, subgroup, and order of the new system for classifying soils and is also placed in its respective great soil group and order of the old classification system (*2*). The new soil orders and families represented in the county are briefly defined. Described in the fourth part is each soil series in the county, including a profile of a soil representative of the series.

Terms common in the new system of soil classification that are used in this section are defined in the Glossary. For further information about the new system, refer to "Soil Classification, a Comprehensive System (*11*)."

Factors in Soil Formation

Soils are the products of soil-forming processes acting upon materials deposited or accumulated by geologic forces. The factors that contribute to the differences among soils are climate, plant and animal life, parent material, topography, and time. Climate and plant and animal life, particularly vegetation, are the active forces in soil formation. Their effect on parent material is modified by topography and by the length of time the parent material has been in place. The relative importance of each factor differs from place to place. In extreme instances one factor dominates in the formation of a soil and determines most of its properties, but normally the interaction of all factors determines the kind of soil that develops in any given place.

Climate

Somerset County has the rather humid, temperate climate that is typical of coastal areas of the Middle Atlantic States. The average temperatures and the distribution of rainfall are given in table 1 (see p. 2). The climate is fairly uniform throughout the county. Differences in elevation are not significant, and there are no obstructions to the movements of winds, clouds, and rainstorms. Masses of air move through the county from the north and west, but they are modified by warm air that moves in periodically from the south and southwest.

This humid, temperate climate has caused most of the soils to be strongly weathered, leached, and acid and to be comparatively low in fertility. In most places the soil material has been weathered to a great depth because it has been exposed to climatic forces for fairly long periods of geologic time. Material that is not deeply weathered is highly resistant to weathering.

No free carbonates occur in the soils of the county, and a large part of the bases has been leached away. All soils are naturally acid, and most of them are strongly acid to extremely acid. Most of the soils are low in plant nutrients, though some have a moderate supply.

Plant and animal life

Before the county was settled, the native vegetation played an important part in the development of soils. The activities of micro-organisms, earthworms, larvae, and other forms of animal life were essential to the cycle of decay and regeneration of vegetation. The first settlers found dense forest that consisted mainly of hardwoods. Oak was the dominant species in most parts of the county. Also important were loblolly pine, pond pine, Virginia pine, yellow-poplar, holly, hickory, maple, and dogwood. Pure stands of pine were few before the county was settled. The fairly pure stands of pine that exist today, particularly of loblolly pine, generally grow in areas that were once cleared and cultivated.

Most hardwood trees take in large amounts of calcium and other bases available in the soils. Soils that are normally high in bases remain so under a cover of deciduous trees because a large proportion of the bases is returned to the soil each year when the leaves fall. When the leaves decompose, the bases reenter the soil and are again used by plants. Thus, there is a never-ending cycle where the soils are high in bases. However, the soils in Somerset County were never high in bases, and the plants could not take in large amounts and return them to the soils. Consequently, the soils are acid, even under a hardwood forest. Soils that are strongly acid and low in fertility are better suited to pines than to most hardwoods. Pines do not require a large amount of calcium and other bases, and their needles do little to restore fertility to the soil.

As agriculture developed in Somerset County, the activity of man influenced the formation of the soils. Clearing, cultivation, the introduction of new plants, and artificial drainage will affect future soil development.

Man's activity has caused a drastic change in the complex of living organisms that affect soil formation. Other important changes brought about by man are the mixing of the upper horizons of the soils, the loss of soil on sloping fields, and changes in the content of plant nutrients, especially in the upper horizons, as a result of liming and fertilizing. The most obvious change in the natural cover is the loss of native vegetation, primarily because of clearing of the forest to make way for farms, towns, and highways. In the forests that remain, there has been a notable increase in the proportion of pine.

Parent material

Most of the soils of Somerset County formed from sediments transported by water, but some of the sediments were transported by wind, and some by ice floes carried by glacial melt water. The texture of the deposits varies from coarse gravel to fine clay.

The stones and boulders must have been transported by ice during the retreat of the last glaciers. The Eastern Shore of Maryland was not glaciated, but the glaciers extended as far south as the northern part of Pennsylvania. Fragments of ice containing clay, gravel, and a few stones and boulders may have descended through the valley of the Susquehanna and other rivers into the area that is now the Eastern Shore. As the ice floes drifted southward, they melted and dropped sediments into the shallow seas. These areas were later uplifted to form the Delmarva Peninsula, of which Somerset County is a part.

The soil material in marshes and other low-lying areas consist of sediments that were deposited in shallow salt water. These sediments were recently elevated to sea level by the slow uplift of the land or by fluctuations in the level of the sea and of the Chesapeake Bay.

The texture of the soil is directly related to the texture of its parent material. The Galestown, Klej, Lakeland, Plummer, Leon, and St. Johns soils developed in coarse-textured material. Evidence indicates that this coarse-textured material, particularly in areas of Galestown

and Lakeland soils, was reworked by wind, water, or both. Both the Galestown and Lakeland soils occur partly on old alluvial terraces along the major streams.

In large areas the soils formed from sediments consisting of a mixture of sand and silt and a small, but variable, amount of clay. In places this material is stratified, and the texture varies in alternating layers. Formed in this material are the Dragston, Downer, Fallsington, Pocomoke, Sassafras, and Woodstown soils.

The Matapeake, Mattapex, Othello, and Portsmouth soils developed in a silty mantle over sand. The silty material is probably loess blown from the glaciated areas to the north and northwest.

Keyport soils developed in fine-textured sediments of clay and silty clay that contained some fine and very fine sand.

Several kinds of recently deposited sediments also occur in the county. The Johnston soils formed in recent deposits of alluvium on flood plains. Muck consists of decomposed organic material.

More than one kind of soil may develop from the same kind of parent material or from similar parent material. This is because factors other than parent material have also influenced the kinds of soils that have developed.

Topography

Somerset County is entirely within the Atlantic Coastal Plain. Most of the county is level or gently sloping. Most of the slopes are less than 2 percent, and there are small, but important, areas that have slopes of 2 and 10 percent. Most of these areas are smooth, but a few are complex and hummocky. A few areas have slopes of 10 to 15 percent. The steeper slopes are generally blufflike escarpments adjacent to major streams, especially the Wicomico and Manokin Rivers. They amount to much less than 1 percent of the county.

Most of the county slopes toward the west, but a part slopes toward the south. In only a few places are there differences in elevation of as much as 20 feet in 1 mile. The highest elevations are in the northeastern part of the county. The highest point, 46 feet above sea level, is on the Worcester County line, about 2 miles northwest of Friendship Church.

The mild relief of the county contributes to the slow drainage of many of the soils. Water flows very slowly into the main channels, especially from areas that are nearly level. It also moves slowly through many of the soils.

Time

The soils of Somerset County range from very young to fairly old. The most recent deposits are on the alluvial flood plains. Here material is added from year to year by floods. Somewhat older, probably of Pleistocene age, are sand, somewhat gravelly sand, and silt over sand. Most of the older Coastal Plain deposits are probably of Pliocene age, but some may be of Miocene age (*6*, *8*).

The effect of time is modified by topography and other factors. For example, on stronger slopes no well-defined horizons have developed, because the soil material has been removed by geologic erosion almost as rapidly as it has formed. On the other hand, profiles are well defined in some soils formed in material that was deposited fairly recently. These soils are in nearly level areas, where there has been no geologic erosion, and the products of the soil-forming processes have remained in place as components of genetic soils.

Genesis and Morphology of the Soils

Most of the soils in Somerset County have evident horizons. The exceptions are some of the alluvial soils and some dunelike formations that developed from almost pure quartz.

The differentiation of horizons in soils of the county is the result of several soil-forming processes. The most important of these are the following: (1) Accumulation of organic matter; (2) leaching of carbonates and salts more soluble than calcium carbonate; (3) chemical weathering, chiefly by hydrolysis, of the primary minerals of parent material into silicate clay minerals; (4) translocation of these silicate clay minerals, and probably of some silt-sized particles, from one horizon to another, and (5) chemical changes (oxidation, reduction, and hydration) and the transfer of iron. These processes have taken place in most of the soils in this county. The degree of activity, or strength, of each process, however, varies for each soil. For example, the interaction of the four processes is reflected in the strong horizons of the Sassafras soils. All five processes have been active in the development of the Keyport, Mattapex, and Woodstown soils. On the other hand, only processes one and five have had a marked effect on the Johnston and Plummer soils. In most soils, however, the parent material must have been affected by the second process, leaching of carbonates and salts, and possibly by some of the other processes as well.

In all of the soils, some organic matter has accumulated to form an A1 horizon. The A1 horizon may have lost its identity as a result of plowing and cultivation that mixed underlying horizons into it to form an Ap horizon. The quantity of organic matter accumulated varies from very low to very high. The Galestown and Lakeland soils have a weak A1 horizon that contains very little organic matter, but the Johnston, Pocomoke, Portsmouth, and St. Johns soils have a prominent A1 horizon that is as much as 15 percent organic matter.

No detailed studies have been made of the clay mineralogy of the soils of the Eastern Shore of Maryland. The soil material of this area consists of sediments from many parts of the Atlantic watershed. These sediments were transported by the Susquehanna, Delaware, and Potomac Rivers. Probably the clay minerals in the present soils vary in composition as well as origin. Kaolinite is one of the main clay minerals in mature soils, such as the Sassafras.

The translocation of silicate clay minerals has had a strong influence on the development of horizons in many soils of the county. Clay has been removed, in part, from the A1 and A2 horizons and has become immobilized, or nearly so, in the B horizon. This is true in all soils that have a textural B horizon. Soils of this kind are the Downer, Dragston, Fallsington, Keyport, Matapeake, Mattapex, Othello, Pocomoke, Portsmouth, Sassafras, and Woodstown. Probably, clay has also been translocated to a slight degree in soils that do not have a distinct textural B horizon, such as the Galestown, Johnston, Klej, Lakeland, and Plummer soils.

TABLE 15.—*Soil series classified according to new and old systems of classification*

Series	New classification				1938 system of classification	
	Family	Subgroup	Suborder	Order	Great soil group	Order
Downer	Coarse loamy, siliceous, mesic.	Alfic Normudults.	Udults	Ultisols	Gray-Brown Podzolic (intergrading toward Regosol).	Zonal.
Dragston	Fine loamy, siliceous, mesic.	Aquic Normudults.	Udults	Ultisols	Low-Humic Gley (intergrading toward Red-Yellow Podzolic).	Intrazonal.
Fallsington	Fine loamy, siliceous, mesic.	Typic Ochraquults.	Aquults	Ultisols	Low-Humic Gley	Intrazonal.
Galestown	Sandy, siliceous, acid, mesic.	Ultic Quarzipsamments.	Psamments	Entisols	Sols Bruns Acides	Intrazonal.
Johnston	Fine loamy, mixed, acid, thermic.	Typic Humaquepts.	Aquepts	Inceptisols	Humic Gley	Intrazonal.
Keyport	Clayey, mixed, mesic.	Paraquic Normudults.	Udults	Ultisols	Red-Yellow Podzolic (intergrading toward Gray-Brown Podzolic).	Zonal.
Klej	Sandy, siliceous, acid, mesic.	Aquic Quarzipsamments.	Psamments	Entisols	Regosol	Azonal.
Lakeland	Sandy, siliceous, acid, thermic.	Typic Quarzipsamments.	Psamments	Entisols	Regosol	Azonal.
Leon	Sandy, siliceous, thermic.	Aeric Normaquods.	Aquods	Spodosols	Ground-Water Podzol	Intrazonal.
Matapeake	Fine silty, mixed, mesic.	Alfic Normudults.	Udults	Ultisols	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Zonal.
Mattapex	Fine silty, mixed, mesic.	Aqualfic Normudults.	Udults	Ultisols	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Zonal.
Othello	Fine silty, mixed, mesic.	Typic Ochraquults.	Aquults	Ultisols	Low-Humic Gley	Intrazonal.
Plummer	Sandy, siliceous, acid, thermic.	Typic Aquipsamments.	Psamments	Entisols	Regosol	Azonal.
Pocomoke	Fine loamy, siliceous, thermic.	Typic Umbraquults.	Aquults	Ultisols	Humic Gley	Intrazonal.
Portsmouth	Fine loamy, siliceous, thermic.	Typic Umbraquults.	Aquults	Ultisols	Humic Gley	Intrazonal.
St. Johns	Sandy, siliceous, thermic.	Typic Normaquods.	Aquods	Spodosols	Ground-Water Podzol	Intrazonal.
Sassafras	Fine loamy, siliceous, mesic.	Alfic Normudults.	Udults	Ultisols	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Zonal.
Woodstown	Fine loamy, siliceous, mesic.	Paraquic Normudults.	Udults	Ultisols	Gray-Brown Podzolic (intergrading toward Red-Yellow Podzolic).	Zonal.

Iron has been reduced and transferred to some degree in all soils that have impeded drainage. In many of the naturally wet soils in Somerset County, this iron reduction process, which is called gleying when it is intense, has been of very great importance. It has particularly affected the Fallsington, Othello, Plummer, Pocomoke, and Portsmouth soils.

In the formation of silicate clays from primary minerals, some iron is freed as an iron oxide. Depending on the degree of hydration, these oxides are red or yellow. A small amount of these oxides is sufficient to color the soil, particularly if silicate clay minerals are abundant and if the parent material is fairly coarse textured. A color B horizon may be formed, even if there has not been enough accumulation of clay minerals to form a textural B horizon. This is characteristic of the Galestown soils in Somerset County. In most well-developed soils, however, the B horizon that develops differs from the horizon above or below it in both color and texture. In Somerset County the Matapeake and Sassafras soils have a B horizon of this kind.

Classification of the Soils

Soils are classified so that we may more easily remember their significant characteristics. Classification enables us to assemble knowledge about soils, to see their relationships to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First, through classification, and then through the use of soil maps, we can apply our knowledge of soils to specific tracts or parcels of land.

Thus, in classification, soils are placed in narrow categories that are used in detailed soil surveys so that knowledge about the soils can be organized and applied in managing farms, fields, and woodlands; in developing suburbs; in engineering work; and in many other ways. Likewise, soils are placed in broad classes to facilitate study and comparison in large areas, such as countries and continents.

Two systems of natural classification of soils are now in general use in the United States. One of these is the

1938 system (*2*), with later revisions. The other, a new system (*7*, *11*), was placed in general use by the Soil Conservation Service in 1965. In this report the newer system is used almost exclusively, but the placement of soils in the older system is also given (see table 15).

Under the new system, all soils are placed in six categories. They are, beginning with the most inclusive, the order, the suborder, the great group, the subgroup, the family, and the series. In this system, the criteria used as bases for classification are observable or measurable properties. The properties are so chosen, however, that soils of similar mode of origin are grouped together.

The 1938 system, with later revisions, also consists of six categories. In the highest of these, the soils of the whole country have been placed into three orders. The next two categories, the suborder and the family, have never been fully developed. As a consequence, they have not been used very much in the past. More attention has been centered on lower categories, the great soil group, the soil series, and the soil type. A further subdivision of the soil type, called the soil phase, has been clearly defined, along with soil type and soil series, in the section "How This Survey Was Made" in the front of this report.

In table 15, each soil series of Somerset County is placed in its family, subgroup, great group, suborder, and order of the new classification system, and in its great soil group and order of the older system.

In the broadest category, the order, there are 10 classes, but only 4 of these are presented in Somerset County. These are the Entisols, the Inceptisols, the Spodosols, and the Ultisols.

Entisols are mineral soils that have changed little from the geologic materials in which they have formed. In Somerset County the principal modification has been a weakly developed A1 horizon.

Inceptisols (from the Latin *inceptum*, or beginning) are mineral soils in which horizons have started to develop. In Somerset County, the Johnston soils are Inceptisols that have a well-developed, very dark colored A1 horizon, but have no other horizons that help to identify the other orders of soils.

Spodosols (from the Greek *spodos*, meaning wood ash) are mineral soils that have horizons in which organic colloids, or iron and aluminum compounds, or both, have accumulated; or they may have thin horizons cemented by iron overlying a fragipan. In the subsoil of the Leon and St. Johns soils, organic colloids have accumulated in a well-defined horizon that is generally cemented.

Ultisols (from the Latin *ultimus*, or last) are soils that are in advanced stages of development. In Somerset County, Ultisols are the most extensive soils. They range from well drained to very poorly drained.

Entisols

In Somerset County, all of the Entisols are of the suborder Psamments (from the Greek *psammos*, or sand). This means that the soils of the suborder are dominantly very sandy throughout. Within the Psamments are the two great groups, Aquipsamments and Quarzipsamments. The Aquipsamments are very sandy soils that are wet much of the time and are dominantly gray in color. The Quarzipsamments are very sandy soils that consist of 95 percent or more of quartz or other normally insoluble minerals; they range from moderately wet to quite dry.

Typic Aquipsamments are wet, gray, very sandy soils that are saturated with water for part of the year. They have a weakly developed A1 horizon that is somewhat darker gray than the subsoil. The Plummer soils of Somerset County are in this subgroup.

Typic Quarzipsamments consist primarily of quartz sand, and may be saturated with water but only for very brief periods. They are not dominantly gray, but on the other hand are not particularly bright colored. The natural drainage is excessive. Except for a weakly developed A1 horizon, there are no horizons that are diagnostic. The Lakeland soils are of this subgroup.

Aquic Quarzipsamments are like Typic Quarzipsamments but have some gray mottles in their subsoil within 40 inches of the surface. They are naturally saturated with water for at least a brief part of the year, and have a fluctuating water table within 40 inches of the surface. The Klej soils are in this subgroup.

Ultic Quarzipsamments are like Typic Quarzipsamments but have a much brighter colored subsoil, which is an incipient or weakly developed B horizon. The Galestown soils of Somerset County are in this subgroup.

Inceptisols

In Somerset County the only Inceptisols are of the suborder Aquepts, which means that they are dominantly gray in color and are wet much of the time. These soils, only of the Johnston series in Somerset County, are in the great group Humaquepts in which the surface layer is dominated by humus or organic matter. The Johnston soils are Typic Humaquepts; they have a thick, black A1 horizon over gray soil material, but not other diagnostic horizons; and they are very poorly drained and wet most of the time.

Spodosols

The Spodosols of Somerset County are of the suborder Aquods, again meaning dominantly wet, and of the group Normaquods, soils normally with a very dark gray or black A1 horizon and with no more than 30 inches of very sandy material over the horizon in which organic matter has accumulated; there is little if any accumulation of iron or aluminum in Normaquods.

The St. Johns soils are Typic Normaquods, they have the thick, very dark gray or black A horizon typical of the group Normaquods. They are very wet and very poorly drained. The Leon soils are Aeric Normaquods; that is, they are better aerated than Typic Normaquods. Their dark-colored surface layer is either not thick enough, not dark enough, or both, for the series to be classed among the Typic Normaquods. Although the Leon soils are naturally wet for much of the year, they are not so poorly drained as the St. Johns soils.

Ultisols

In Somerset County, the Ultisols are of the suborders Aquults and Udults. The Aquults have a Bt horizon that is dominantly gray, and they are wet and poorly drained.

The Udults are normally moist but not wet, and at least some part of their Bt horizon is brighter in color than the Bt horizon of the Aquults. Udults are dominantly not gray, but some hue of yellow, brown, or red.

The suborder Aquults is divided in Somerset County into the great groups Ochraquults and Umbraquults, the former with a gray or light gray A horizon, and the latter with a very dark gray or black A1 horizon.

Typic Ochraquults are naturally saturated with water for part of the year, have a Bt horizon of clay accumulation that is dominantly gray, and have a light-colored A horizon. In Somerset County the Typic Ochraquults are soils of the Fallsington and the Othello series.

Typic Umbraquults differ from the Typic Ochraquults in having a very dark gray or black A horizon, even when plowed to a depth of 10 inches. In Somerset County they include soils of the Pocomoke and Portsmouth series.

The suborder Udults in Somerset County consists only of the great group Normudults, the normal soils of the suborder. However, the great group is divided into Alfic, Aqualfic, Aquic, and Paraquic subgroups.

Alfic Normudults show no evidence of wetness. They have a Bt horizon of clay accumulation with fairly bright colors; that is, the Bt horizon has a chroma of no more than 4 in some part, while Typic Normudults (not represented in Somerset County) have a Bt horizon with a chroma of 6 or more in all parts, or definitely brighter colors than the Bt horizon of the Alfic Normudults. The Alfic Normudults are well drained. In this subgroup in Somerset County are the Downer, Matapeake, and Sassafras series.

Aqualfic Normudults are like Alfic Normudults except that they have some gray mottling (chroma of 2 or less) within the upper 20 inches of their Bt horizon. They are moderately well drained. The Mattapex series represents this subgroup in Somerset County.

Aquic Normudults are like Typic Normudults but show considerable evidence of wetness. They have gray mottles (chroma of 2 or less) within the upper 10 inches of their Bt horizon. The Dragston soils are in this subgroup in Somerset County. They are somewhat poorly drained.

Paraquic Normudults are like Typic Normudults but have some gray mottles (chroma of 2 or less) between 10 and 20 inches below the upper boundary of the Bt horizon, but not within the upper 10 inches. The Keyport and the Woodstown series represent this suborder in Somerset County. They are moderately well drained.

Soil families.—Families of soils within subgroups are differentiated on the basis of texture, coarse fragments, mineralogy, and mean annual soil temperature, and sometimes some additional factors, such as acidity. This report contains no discussion of these factors, but it should be pointed out that Somerset County is approximately on the indefinite boundary between the thermic (warm to hot) and the mesic (temperate) soil temperature zones. For this reason, some of the soils of the county have been placed in thermic families and some in mesic families.

It should also be pointed out that all placements of soil series in the new classification system are still somewhat tentative, and that the placement of some soils, particularly into families, may be changed as more precise and better documented placement becomes possible.

Technical Descriptions of the Soils

This section describes in detail a profile of each soil series mapped in Somerset County. The individual profile described is as nearly representative of the series, as it occurs in Somerset County, as it has been possible to find. In most cases this profile will also represent the modal, or central, concept of the series as defined by the National Cooperative Soil Survey.

In addition to a detailed profile description, there are notes or statements on each of the following items or accessory characteristics for the soils of each series: The subgroup and family classification; the range in characteristics of the series as it occurs in Somerset County; differences from similar or competing soil series in the county; differences from other soils developed in the same kind of material, if any; the natural vegetation; principal uses of the soils; and extent and importance in the county.

Downer series

The soils of the Downer series are Alfic Normudults in a coarse loamy, siliceous, mesic family. These soils have a thick, sandy A horizon over a somewhat finer textured, moderately expressed B2t horizon. The B2t horizon typically has a hue of 7.5YR and, at least in some part, a chroma of less than 6. The C horizon is very friable and sandy. These soils normally are strongly acid or very strongly acid unless they have been limed.

Profile of the Downer loamy sand, in an intensively cultivated nearly level area, about half a mile east of the intersection of Polk Road and Redding Ferry Road:

Ap—0 to 8 inches, grayish-brown (2.5Y 5/2) heavy loamy sand; single grain (structureless); very friable when moist, slightly sticky and nonplastic when wet; roots plentiful; neutral (limed for a long period); abrupt, smooth boundary. 7 to 9 inches thick.

A2—8 to 16 inches, pale-brown (10YR 6/3) loamy sand; very weak, fine and medium, granular structure; very moist, slightly sticky and nonplastic when wet; few roots; many worm and insect channels; slightly acid or neutral; clear, wavy boundary. 4 to 10 inches thick.

B2t—16 to 22 inches, dark-brown (7.5YR 4/4) heavy sandy loam; weak, fine and medium, blocky structure; friable when moist, slightly sticky and slightly plastic when wet; few roots; many wormholes; slightly acid; clear, wavy boundary. 5 to 24 inches thick.

B3—22 to 28 inches, dark-brown (7.5YR 4/4) sandy loam; weak fine and medium, blocky structure; friable when moist, slightly sticky and slightly plastic when wet; no roots; few wormholes; slightly acid; clear, wavy boundary. 0 to 8 inches thick.

C—28 to 38 inches +, strong-brown (7.5YR 5/6) light sandy loam; massive (structureless) to irregular, very weak, blocky structure; very friable when moist, slightly sticky and nonplastic when wet; no roots; medium acid.

In Somerset County the texture of the A horizon is loamy sand. The B2t horizon contains more clay and, in most places, more silt than the A horizon, but the B2t horizon typically is less than 18 percent clay. The B3 horizon, which is lacking in places, is coarser than the B2t but contains more clay than the A horizon. The C horizon is sand, loamy sand, or light sandy loam. A transitional B1 horizon, up to 6 inches thick, occurs in some places. The solum ranges from about 24 to nearly 40 inches in thickness.

In wooded or other undisturbed areas, the A1 horizon is up to about 3 inches thick. The A horizon is 10YR or 2.5Y in hue. In most places the A1 or the Ap horizon, if moist, has a value of 4 or 5 and a chroma of 2. The A2 horizon has a value of 5 or 6 and a chroma ranging from 2 to 4. In the B horizon, hue is generally 7.5YR but is 5YR in some places. Value of the B horizon is 4 or 5, and chroma ranges from 4 to 8. Hue of the C horizon is commonly 10 YR but is 7.5YR in some places. Value of the C horizon is 5 or 6, and chroma is 3 to 6. For all horizons, the value of a dry soil may be one or two units higher than those given, which are for a moist soil. In some places the C horizon is variegated with colors that are either redder or higher in chroma than the matrix, or both. The soil material in these variegations is somewhat finer textured than the matrix.

The A and C horizons generally are structureless, but in some places structure is very weak, granular in the A horizon and very weak, blocky in the C. In some places the B2t horizon has moderate instead of weak structure, and part of it may be subangular blocky instead of blocky. The B2t horizon is the most sticky and the most plastic horizon in the profile, but it is only slightly plastic and generally is only slightly sticky, though it is moderately sticky in some places.

The Downer soils occur on nearly level to moderately sloping or rolling interfluvial uplands. They formed in sandy sediments that contain fairly small amounts of silt and clay. These soils grade into the Galestown soils on the one hand and into the Sassafras soils on the other. Their range in color is much the same as that of the Galestown and Sassafras soils. Nevertheless, the B horizon of Downer soils is not so thick, so fine in texture, nor so sticky as that of the Sassafras soils.

In Somerset County most of the acreage of Downer soils is cultivated. The principal crops are soybeans, corn, and various truck crops, especially sweetpotatoes. Some strawberries are grown. The wooded areas are mainly in upland hardwoods, particularly oaks. In some places, cutover and second-growth areas have mixed to almost pure stands of loblolly pine or Virginia pine. The Downer soils are of limited extent in the county, but they are important in agriculture and generally are intensively used.

Dragston series

Soils of the Dragston series are Aquic Normudults in a fine loamy, siliceous, mesic family. These soils typically have an A horizon and an upper B horizon that are characteristic of Normudults, but their lower B horizon is wet and strongly gleyed. The B2tg horizon is mottled with gray within 10 inches of the top of the B horizon. The Dragston soils are very strongly acid or extremely acid unless they have been limed.

Profile of the Dragston fine sandy loam, in a level wooded area at the intersection of New Road and Cokesbury Road:

A1—0 to 3 inches, very dark brown (10YR 2/2) fine sandy loam; very weak, fine, granular structure; slightly hard when dry, very friable when moist, slightly sticky and nonplastic when wet; abundant roots; very strongly acid or extremely acid; clear, smooth boundary. 1 to 4 inches thick.

A2—3 to 7 inches, olive-brown (2.5Y 4/4) fine sandy loam; very weak, fine, subangular blocky structure; slightly hard when dry, very friable when moist, slightly sticky and nonplastic when wet; common roots; very strongly acid; gradual, wavy boundary. 4 to 8 inches thick.

B1—7 to 14 inches, light olive-brown (2.5Y 5/4) heavy fine sandy loam; weak and moderate, fine, subangular blocky structure; slightly hard when dry, friable when moist, slightly sticky and nonplastic when wet; few roots; very strongly acid; gradual, smooth boundary. 0 to 8 inches thick.

B2tg—14 to 21 inches, olive (5Y 5/3) fine sandy clay loam with few, faint mottles of light olive brown and gray (2.5Y 5/6 and 5Y 5/1); weak, fine, subangular blocky structure; hard when dry, friable when moist, sticky and slightly plastic when wet; few roots; very strongly acid; gradual, wavy boundary. 7 to 15 inches thick.

B3g—21 to 26 inches, light brownish-gray (2.5Y 6/2) fine sandy loam with common, fine, distinct mottles of yellowish brown and gray (10YR 5/4 and 5Y 5/1); weak, fine, granular structure; slightly hard when dry, friable when moist, sticky and slightly plastic when wet; very few roots; very strongly acid; clear, wavy boundary. 5 to 10 inches thick.

C1g—26 to 35 inches, gray (5Y 5/1) heavy loamy fine sand with common, medium, prominent mottles of yellowish brown (10YR 5/6); single grain (structureless); very friable when moist, nonsticky and nonplastic when wet; very few roots; extremely acid; clear, smooth boundary. 6 to 15 inches thick.

IIC2g—35 to 60 inches +, variegated light-gray and light olive-gray (5Y 7/1 and 5Y 6/2) loose, structureless fine sand; no roots; very strongly acid.

In Somerset County the A horizon is either loam or fine sandy loam. The B horizon is partly sandy clay loam and partly fine sandy loam. It is more than 18 percent clay, and the sand is dominantly either fine or medium. In places the transitional B1 and B3 horizons are thin or absent and the B2tg horizon is thicker than that described. The solum ranges from about 24 to 40 inches in thickness.

In cultivated areas the Ap horizon is about 10 inches thick. The Ap and A1 horizons generally have a hue of 10YR, a value of 2 to 4, and a chroma of 1 or 2. The A2 and B1 horizons have a hue of 10YR or 2.5Y, a value of 4 to 6, and a chroma of 2 to 4. The B2, B3, and C horizons are 2.5Y or 5Y in hue and typically are yellower than the A horizon. Value of the B2, B3, and C horizons is 5, 6, or 7 and generally increases with depth, but chroma generally decreases with depth and is 1, 2, or 3. Mottling normally begins at a depth of 12 to 15 inches, and there is mottling with chroma of 2 or less in the top 10 inches of the B horizon. Contrast of the mottling is low in the upper part of the profile and increases with depth through the C1g horizon.

Structure generally is weak to very weak throughout the profile but in a few places is moderate in some horizons. Structure grades from granular in the A1 horizon to subangular blocky in the upper and middle parts of the B horizon and back to granular in the B3. The C horizon is structureless. Stickiness is greatest in the B2tg horizon, which contains the most clay. No horizon is significantly plastic.

In Somerset County the Dragston soils grade into the Fallsington soils and in most places are mapped with them as undifferentiated groups of soils. The Dragston soils are not so wet nor so poorly drained as the Fallsing-

ton soils and are not mottled so close to the surface. The chroma of the Dragston soils is high in the A horizon and the upper part of the B horizon. Also occurring closely with the Dragston soils are the Sassafras, Woodstown, and Pocomoke soils, all of which have formed in moderately clayey and silty sands over very sandy sediments. The Dragston soils are more poorly drained than the Sassafras and the Woodstown soils but are much better drained than the very poorly drained Pocomoke soils.

About half the acreage of Dragston soils is still wooded, but a fairly large part is cultivated. Because they occur so closely with areas of Fallsington soils, some areas of Dragston soils are also artificially drained, to some extent, when the Fallsington soils are drained. This drainage makes the Dragston soils more suitable for most crops, especially corn and soybeans. Improved pastures on Dragston soils are few in the county. In the uncultivated areas are fairly water-tolerant hardwoods, such as red maple, sweetgum, a variety of oaks, and holly. In some places, cutover and second-growth areas have mixed stands to almost pure stands of loblolly pine. The Dragston soils are not extensive but are considerably important for farming and for wood products.

Fallsington series

The soils of the Fallsington series are Typic Ochraquults in a fine loamy, siliceous, mesic family. These soils typically have a moderately coarse or medium-textured A horizon over finer textured, gleyed, moderately permeable B21tg and B22tg horizons. The substratum is wet and sandy. Fallsington soils occur on level to gently sloping interfluvial uplands and formed in moderately clayey and silty sand over very sandy sediments.

Profile of the Fallsington sandy loam, in a level cultivated area just north of Perryhawkin Road, about 300 feet east of its intersection with Boston Road:

Ap—0 to 9 inches, dark grayish-brown (2.5Y 4/2) sandy loam; very weak, fine to medium, granular structure; slightly hard when dry, friable when moist, slightly sticky and nonplastic when wet; fine roots common; slightly acid (limed); abrupt, smooth boundary. 8 to 10 inches thick.

Blg—9 to 14 inches, light brownish-gray (2.5Y 6/2) loam with abundant, medium, faint mottles of dark grayish brown (2.5Y 4/2) and a few, fine, distinct mottles of yellowish brown (10YR 5/4); weak, fine to medium, subangular blocky structure; hard when dry, friable when moist, slightly sticky and nonplastic when wet; few roots; dark grayish-brown (2.5Y 4/2) fine material in wormholes and old root channels; strongly acid; gradual, wavy boundary. 0 to 6 inches thick.

B21tg—14 to 24 inches, pale-olive (5Y 6/3) heavy sandy loam with many, medium, faint mottles of gray or light gray (5Y 6/1) and a few, medium, distinct mottles of light olive brown (2.5Y 5/6); weak, fine to medium, subangular blocky structure; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; a few fine roots; many wormholes and old root channels; very strongly acid; gradual, wavy boundary. 8 to 15 inches thick.

B22tg—24 to 30 inches, gray or light-gray (5Y 6/1) heavy sandy clay loam with common, medium, prominent mottles of yellowish brown (10YR 5/8); moderate, fine and medium, subangular blocky structure; very hard when dry, firm when moist, sticky and plastic when wet; a few fine roots; very strongly acid or extremely acid; clear, wavy boundary. 6 to 10 inches thick.

B3g—30 to 37 inches, gray or light-gray (5Y 6/1) sandy loam with common, medium, prominent mottles of yellowish brown (10YR 5/8); weak, medium, granular structure; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; no roots; very strongly acid; abrupt, wavy boundary. 0 to 8 inches thick.

IICg—37 to 54 inches +, gray or light-gray (10YR 6/1) sand with common, coarse, distinct mottles of light yellowish brown (2.5Y 6/4); single grain (structureless); no roots; very strongly acid.

The texture of the A horizon is sandy loam, fine sandy loam, or loam. The B21tg and B22tg horizons are mostly sandy clay loam but range from heavy sandy loam to heavy sandy clay loam. These horizons typically have a content of clay that is more than 18 percent. The C horizon is sand, loamy sand, or light sandy loam. B1 and B3 horizons occur in some places and are transitional in texture and in most other characteristics. The solum ranges from about 20 to 40 inches in thickness but is generally somewhat less than 30 inches thick. In some places a thin Cg horizon occurs just below or replaces the B3g horizon. The Cg horizon resembles the B3g horizon but is slightly more sandy, is structureless, and commonly is neither sticky nor plastic.

In wooded or other undisturbed areas, there is an A1 horizon up to 4 inches thick and an A2 horizon up to 10 or 12 inches thick. These horizons are similar to the Ap horizon in texture, structure, and consistence. In a moist soil the hue of the A horizon is generally 2.5Y, but in some places, it is 10YR or 5Y. The Ap and the A1 horizons generally have a value of 3 or 4 and a chroma of 1 or 2. Value of the A2 horizon is 5 or 6, and chroma is 1 or 2. In the B horizon the hue of the matrix is generally 5Y but, in some places, is 10YR, 2.5YR, or neutral. The value of the matrix in the B horizon is 5 or 6, and the chroma is generally 0 or 1. In the Blg and B21tg horizons chroma may be as high as 3. Mottles in the B horizon have a hue of 10YR or yellower, a value generally of 5 or 6, and a chroma of 3 to 8. The higher chroma generally is in the finer textured horizons. In the Blg and B21tg horizons that have a matrix chroma of 2 or 3, the mottles may have a chroma of 1. The C horizon has a hue of 10YR, 2.5Y, 5Y, or neutral, a value of 6 or 7, and a chroma of 0 or 1. For all horizons, the value of a dry soil is generally one unit higher than those values given, which are for a moist soil. Where the C horizon is mottled, the mottles have a chroma that is two units higher than that of the mottles in the B horizon.

Structure of the A horizon is generally very weak and granular, but in some places an A2 horizon with weak, subangular structure may have developed. Structure is mostly weak and moderate, subangular blocky in the B1 and B2 horizons and weak, granular or subangular blocky in the B3 horizon. Except in a very few places, the C horizon is structureless. Stickiness and plasticity are greatest in the B21tg and B22tg horizons, where there is the most clay. Unless the Fallsington soils have been limed, they are strongly acid in all horizons.

In Somerset County, the Fallsington soils grade into the Dragston soils and in some places are mapped with them as undifferentiated groups of soils. The Fallsington

soils are wetter and more poorly drained than the Dragston soils, have lower chroma in the A horizon and the upper parts of the B horizon, and are mottled closer to the surface. The Fallsington soils are similar to the Othello soils in color and degree of wetness but contain more sand and less silt throughout the profile.

Soils other than the Dragston that occur closely with the Fallsington soils are the Sassafras and Pocomoke soils. These soils developed in the same kind of material as did the Fallsington—moderately clayey and silty sands over very sandy sediments. The Fallsington soils are more poorly drained than the Sassafras and the Woodstown soils but are better drained than the Pocomoke soils.

The Fallsington soils are cultivated in areas of considerable size, but larger areas are still wooded. Artificial drainage is needed for most crops, particularly corn and soybeans. Improved pastures on Fallsington soils are few in the county. In uncultivated areas the vegetation is mainly red maple, sweetgum, many water-tolerant oaks, holly, and pond pine. Some of the many cutover areas and areas of second-growth trees have mixed stands to almost pure stands of loblolly pine. The Fallsington soils are among the more extensive soils in Somerset County and are of considerable importance both for farming and for wood products.

Galestown series

The soils of the Galestown series are Ultic Quarzipsamments in a sandy, siliceous, acid, mesic family. These soils typically are coarse textured. They have a strong-brown B2 horizon and show no evidence of wetness. The Galestown soils are strongly acid or very strongly acid unless they have been limed.

Profile of Galestown loamy sand, clayey substratum, in a very gently sloping wooded area, about 700 feet east of State Route 363 and 1 mile south of the bridge over Upper Thorofare, on Deal Island:

A1—0 to 8 inches, olive-brown (2.5Y 4/4) loamy sand; structureless; very friable when moist; common roots; dark-gray root channels; very strongly acid; abrupt, wavy boundary. 6 to 8 inches thick.

B1—8 to 24 inches, yellowish-brown (10YR 5/6) loamy sand; structureless; very friable when moist; common roots; some dark-gray root channels; strongly acid or very strongly acid; gradual, wavy boundary. 12 to 20 inches thick.

B2—24 to 40 inches, strong-brown (7.5YR 5/6) loamy sand; structureless; very friable when moist; few fine roots; very strongly acid; clear, wavy boundary. 12 to 20 inches thick.

C—40 to 58 inches, yellow (10YR 7/6) sand; single grain (structureless); no roots; strongly acid; abrupt, smooth boundary. 15 to 24 inches thick.

IIC2—58 to 66 inches +, very pale brown (10YR 7/3) sandy loam with faint, light-gray horizontal streaks; massive; friable when moist, sticky and slightly plastic when wet; no roots; very strongly acid.

The Galestown soils are coarse-textured throughout the solum and normally in the C horizon. The A and B horizons are sand or loamy sand, but the C horizon is almost invariably sand. Within a depth of 6 feet in the gently sloping loamy sands, a sandy loam or loamy sand IIC horizon occurs that is finer textured than the overlying horizons. This horizon is not diagnostic. The solum ranges from about 30 to nearly 50 inches in thickness.

In cultivated areas the Ap horizon is about 10 inches thick. The A1 horizon is 10YR or 2.5Y in hue, but the Ap horizon ranges from 10YR to 7.5YR in hue because the upper part of the B horizon has been mixed into it. The value of the A1 and Ap horizons range from 4 to 6, and chroma ranges from 1 to 4. The B1 horizon is 10YR or 7.5YR in hue, but the B2 horizon is as red as 7.5YR and, in places, has a hue of 5YR. Normally, the value of the B horizon is 5 and the chroma is 6 to 8, though chroma in the B1 horizon is 3 or 4 in some places. The C horizon ranges from 10YR to 5Y in hue, from 5 to 7 in value, and from 2 to 6 in chroma. Value and chroma of the C horizon normally decrease with depth. The IIC horizon, if it occurs, may be almost any color. Except within or, in places, immediately above the IIC horizon, the Galestown soils show no gray mottling or other evidence of wetness.

Typically, the Galestown soils are structureless or, at most, have weak granular structure in the plow layer, into which large amounts of organic matter may have been mixed. The profile is not sticky or plastic above the IIC horizon.

The Galestown soils grade into the Lakeland soils and in some places are mapped with them in undifferentiated groups of soils. The Galestown soils and the Lakeland soils are much alike, except that the Lakeland soils do not have a B horizon and are Typic Quarzipsamments instead of Ultic Quarzipsamments. The Galestown soils also grade into the Downer soils, but Galestown soils do not have the moderately expressed B2t horizon that underlies a thick sandy A1 horizon in Downer soils.

The gently sloping Galestown soils are mostly cultivated, except in some areas where they are intricately intermingled with the Lakeland soils. Most of the strongly sloping Galestown soils are still wooded. Most cultivated areas are used for corn, soybeans, and various truck crops, especially sweetpotatoes, melons, and cucumbers. The vegetation in uncultivated areas is scrub hardwoods, mostly oaks, and some Virginia pine. Some areas that have been reforested are in loblolly pine and a little undergrowth. The Galestown soils have a fairly limited acreage in Somerset County but, in some areas, are locally important for farming.

Johnston series

The soils of the Johnston series are Typic Humaquepts in a fine loamy, mixed, acid, thermic family. These soils typically are very wet and have in their profile a very thick, black A horizon that is directly underlain by a nonconforming sandy C horizon. These soils are very strongly acid or extremely acid unless they have been limed.

Profile of the Johnston loam, in a level wooded area, about four-tenths of a mile south of the intersection of Pete's Hill Road and West Post Office Road:

A11—0 to 25 inches, black (10YR 2/1) highly organic loam; weak, fine and medium, granular structure; friable when moist, slightly sticky and slightly plastic when wet; roots plentiful; many white, uncoated sand grains; very strongly acid or extremely acid; clear, wavy boundary. 16 to 20 inches thick.

A12—25 to 30 inches, black (5YR 2/1) loam or silt loam high in amorphous organic matter; massive to very weak and indistinct blocky structure; firm when moist, sticky and plastic when wet; roots plentiful

in upper 2 inches; very strongly acid or extremely acid; abrupt, wavy boundary. 4 to 14 inches thick.

IICg—30 to 50 inches +, light brownish-gray (10YR 6/2), water-bearing loamy sand that becomes a paler, more olive hue, with depth; single grain (structureless); no roots; very strongly acid or extremely acid.

The Johnston soils in Somerset County have only a loam surface layer. Above the IICg horizon, the profile varies little in texture or any other characteristic except for a thin C horizon of loamy material that may occur between the A12 and IICg horizons. At a depth below 4 or 5 feet in some places, there is a very clayey, slowly permeable stratum that helps to support a high water table. The IICg horizon ranges from sand to sandy loam. The solum consists entirely of the A horizon and ranges from 20 to 30 inches in thickness.

In some wooded or other undisturbed areas, the surface layer is black and somewhat mucky. In areas that have been cultivated for fairly long periods, the surface layer is very dark gray and has a value of 3 and a chroma of 0 or 1. Hue ranges from neutral to 5Y or 5YR. The C horizon is almost any color but everywhere is gleyed.

The Johnston soils are structureless or are weak and granular in the A horizon. Stickiness and plasticity range from slight to medium in the solum.

In Somerset County the Johnston soils are the only soils of any series that occur on the flood plains of streams. They superficially resemble the Pocomoke and the Portsmouth soils but lack the B horizon of those soils. The B horizon of Pocomoke soils is sandy clay loam, and that of the Portsmouth soils is silty clay loam.

Most areas of Johnston soils are still woodland that has vegetation consisting of silver maple, gum, holly, pond pine, and some water-tolerant oaks. Cleared areas are used chiefly for corn or pasture. These soils are of limited extent but are important agriculturally along some of the major streams.

Keyport series

The soils of the Keyport series are Paraquic Normudults in a clayey, mixed, mesic family. These soils typically have a medium-textured or moderately coarse textured A horizon over fine-textured, slowly permeable B21t and B22t horizons that show evidence of seasonal wetness in their lower part. The Keyport soils are very strongly acid or extremely acid unless they have been limed.

Profile of the Keyport silt loam, in a nearly level cultivated area, just west of the intersection of Meadow Bridge Road with McGrath Road:

Ap—0 to 9 inches, dark grayish-brown (2.5Y 4/2) silt loam; weak, fine and medium, granular structure; friable when moist, slightly sticky and slightly plastic when wet; common roots; medium acid (limed); abrupt, smooth boundary. 8 to 10 inches thick.

B21t—9 to 22 inches, brownish-yellow (10YR 6/6) silty clay or heavy silty clay loam; moderate, fine and medium, blocky structure; firm when moist, sticky and very plastic when wet; few roots; some discontinuous, thin, olive-gray (5Y 4/2) silt coatings; very strongly acid; clear, wavy boundary. 10 to 14 inches thick.

B22t—22 to 31 inches, yellowish-brown (10YR 5/6) silty clay with common, fine and medium, prominent mottles of light gray, (N 7/0), pale olive (5Y 6/3), and red (2.5YR 4/6); moderate, medium, blocky structure; firm when moist, sticky and very plastic when wet; very few roots; thin, continuous, light yellowish-brown (2.5Y 6/4) clay coatings and thin, olive-gray (5Y 4/2) silt coatings; very strongly acid; clear, wavy boundary. 8 to 13 inches thick.

B3—31 to 45 inches, variegated strong-brown (7.5YR 5/6) and brownish-yellow (10YR 6/6) clay loam with many, medium and coarse, prominent mottles of light gray (N 7/0); weak, fine and medium, blocky structure; friable or firm when moist, slightly sticky and plastic when wet; no roots; few, thin, light yellowish-brown (2.5YR 6/4) clay coatings, mostly on horizontal faces; some soft iron concretions ¼ to ½ inch in diameter in lower part; very strongly acid; gradual, wavy boundary. 12 to 15 inches thick.

IICg—45 to 55 inches +, light-gray (2.5Y 7/2) very fine sandy clay loam with many, medium, distinct mottles of yellowish brown (10YR 5/6); massive with some very weak blocky structure in upper part; firm when moist, sticky and plastic when wet; no roots; very strongly acid.

In Somerset County, the A horizon of Keyport soils is fine sandy loam or silt loam. In the larger part, the B21t and B22t horizons are fine textured and typically have a content of clay greater than 35 percent. The B3 horizon is clay loam, silty clay loam, sandy clay loam, or, in local areas, sandy clay. In some places a silty horizon is just below or replaces the B3 horizon. The nonconforming IIC horizon may be of any sandy texture.

In wooded or other undisturbed areas, there is an A1 horizon 1 to 4 inches thick and an A2 horizon 4 to 10 inches thick.

In most places the Ap or A1 horizon and the B21t and B22t horizons are 10YR or 2.5Y in hue, but in some places these B2t horizons approach 7.5YR. Normally, the A1 or Ap horizon has a value of 3 or 4 and a chroma of 1 or 2. The B21t and B22t horizons have a value of 4, 5, or 6, and a chroma that generally is 6 but ranges from 3 to 8. The mottling in the B22t is highly variable, but normally grayish colors dominate and highly contrasting red or reddish mottling is in small amounts. The C horizon is dominated by gray and is strongly mottled in places. The B3 horizon is transitional in color.

Structure is generally weak or moderate granular in the A horizon, but in places the A2 horizon has thin, weak, platy structure. The B21t and B22t horizons have moderate blocky structure. Keyport soils generally have stronger structure than any other soils in the county. Also, their B21t and B22t horizons are as sticky as those of any other soils in the county and commonly are more plastic.

The Keyport soils are similar to the Mattapex and the Woodstown soils in color and degree of wetness but are finer textured in the subsoil. No other soils in Somerset County have such a fine-textured subsoil as the Keyport. The B21t and B22t horizons of the Mattapex soils are of light silty clay loam, and those of the Woodstown soils are sandy clay loam or heavy sandy loam.

In Somerset County most of the acreage of Keyport soils is used for corn or soybeans. The native vegetation is mostly mixed oaks and some sweetgum and red maple. The Keyport soils are of minor extent in the county and are only locally important to farming.

Klej series

The soils of the Klej series are Aquic Quarzipsamments in a sandy, siliceous, acid, mesic family. These soils typically are coarse textured and very strongly acid throughout. They lack a B horizon of any kind and are somewhat mottled at a depth of less than 30 inches. The

Klej soils occur on level to gently sloping interfluvial uplands.

Profile of the Klej loamy sand, in a level loblolly pine forest, about five-eighths of a mile north of Chance:

A11—0 to 1 inch, olive-gray (5Y 5/2) loamy sand; single grain (structureless); roots plentiful; very strongly acid; clear, irregular boundary. 1 to 3 inches thick.

A12—1 inch to 5 inches, light olive-brown (2.5Y 5/4) loamy sand; single grain (structureless); roots common; very strongly acid; clear, irregular boundary. 2 to 4 inches thick.

C1—5 to 20 inches, olive-yellow (2.5Y 6/6) loamy sand; single grain (structureless); few roots; strongly acid or very strongly acid; clear, irregular boundary. 8 to 15 inches thick.

C2—20 to 30 inches, brownish-yellow (10YR 6/6) sand with common, medium, faint mottles of light yellowish brown (2.5Y 6/4) and light brownish gray (2.5Y 6/2); single grain (structureless); very few roots; strongly acid; gradual, irregular boundary. 4 to 12 inches thick.

C3g—30 to 48 inches, light brownish-gray (2.5Y 6/2) sand with many, coarse, prominent mottles of brownish yellow (10YR 6/6); single grain (structureless); no roots; medium acid; abrupt, irregular boundary. 10 to 20 inches thick.

C4—48 to 55 inches +, pale-yellow (5Y 7/3) sand; single grain (structureless); no roots; medium acid.

The Klej soils are coarse textured throughout, but in some places are underlain by a nonconforming IIC horizon that is moderately coarse or medium textured. The IIC horizon is far below the surface. In Somerset County, the A horizon and the upper C horizon are loamy sand and the lower C horizon is sand.

In cultivated areas an Ap horizon is up to 10 inches thick. Hue throughout the profile is generally 2.5Y but in any horizon ranges from 10YR to 5Y. The Ap and the A11 horizons have a value of 4, 5, or even 6 in a few places, and a chroma of 1 or 2. The A12 horizon ranges from 4 to 6 in value and from 2 to 4 in chroma. The C1 and C2 horizons have a value of 5 or 6 and a chroma generally of 4 or 6 but in a few places as low as 2. The C3 and the C4 horizons normally have a value of 6 or 7 and a chroma ranging from 1 to 3. The depth to mottling ranges from about 15 to 24 inches. The contrast of the mottles to the matrix is less in the upper part of the profile than it is in the lower part.

Typically, the Klej soils are structureless, but in some cultivated areas they have weak granular structure in the plow layer and locally, irregular, very weak, blocky structure in the upper part of the C horizon. These soils are not sticky or plastic in the C horizon. Although Klej soils are normally very strongly acid or extremely acid unless they have been limed, acidity decreases in the lower horizons in very low areas near salt water.

The Klej soils somewhat resemble the Woodstown soils in color and in degree of wetness, but unlike Woodstown soils they lack B21t and B22t horizons. The Klej soils commonly occur with and grade into the Galestown, Lakeland, Leon, and Plummer soils, all of which formed in very sandy sediments that are similar to those in which the Klej soils formed. The Klej soils are not so well drained as the Galestown and Lakeland soils, which show no evidences of wetness. The Klej soils are not so wet nor so gray as the Leon and Plummer soils and do not have a B2h horizon, as have the Leon soils.

The Klej soils have relatively small acreage in Somerset County. Some areas are farmed, but many are still wooded. The principal crops are corn and soybeans, but some truck crops are grown. In uncultivated areas the principal vegetation consists of mixed oaks, sweetgum, and some red maple, and there are some loblolly pines or a few Virginia pines in cutover areas and areas of second-growth trees.

Lakeland series

The soils of the Lakeland series are Typic Quartzipsamments in a sandy, siliceous, acid, thermic family. These soils are typically coarse textured and strongly acid or very strongly acid throughout, unless they have been limed. They lack a B horizon of any kind and show no evidence of wetness.

Profile of Lakeland loamy sand, clayey substratum, in a gently sloping wooded area just east of Backbone Hill, about 1 mile south of the Wicomico County line and three-fourths of a mile west of the Worcester County line:

A11—0 to 6 inches, grayish-brown (2.5Y 5/2) loamy sand; single grain (structureless); roots plentiful; strongly acid; clear, smooth to wavy boundary. 1 to 6 inches thick.

A12—6 to 17 inches, light yellowish-brown (2.5Y 6/4) loamy sand; single grain (structureless); common roots; very strongly acid; clear, wavy boundary. 6 to 12 inches thick.

C1—17 to 36 inches, light yellowish-brown (10YR 6/4) loamy sand with a very few thin lamellae of slightly finer material; single grain (structureless); few roots; strongly acid or very strongly acid; gradual, irregular boundary. 15 to 30 inches thick.

C2—36 to 52 inches; pale-yellow (2.5Y 7/4) sand slightly streaked with gray in lower part; single grain (structureless); very few roots; very strongly acid; abrupt, smooth boundary. 15 to 25 inches thick.

IIC3g—52 to 60 inches +, light-gray (5Y 7/1) sandy clay loam with faint horizontal streaks of pale yellow (2.5Y 8/4); massive; firm when moist, sticky and plastic when wet; no roots; very strongly acid.

The Lakeland soils are coarse textured throughout the profile, except in the nonconforming IIC horizon, which has moderately coarse to medium texture. The A horizon and the upper C horizon are sand or loamy sand, but the lower horizon, almost invariably, is sand. The finer textured IIC horizon occurs within 6 feet of the surface and generally is loamy sand. It generally occurs where slopes are gentle. The IIC horizon is not diagnostic.

In cultivated areas the Ap horizon is about 10 inches thick. Above the IIC horizon, hue is 2.5Y or 10YR and is never redder than 10YR. The A horizon generally has a value of 5 or 6. Chroma is generally 2 in the A11 and the Ap horizons and is 3 or 4 in the A12 horizon. In the C horizon, value is 6 or 7 and chroma generally is 4 but may be as high as 6. Where a IIC horizon occurs, it may be of almost any color. Except within or immediately above the IIC horizon, there is no grayness, mottling, or any other evidence of wetness. The Lakeland soils typically are structureless, and there is no stickiness or plasticity above the IIC horizon.

The Lakeland soils grade into the Galestown soils and in some places are mapped with them as undifferentiated groups of soils. Lakeland and Galestown soils are much the same except that the Galestown soils have a B horizon that the Lakeland soils lack. The Lakeland soils are better drained than the Klej soils, which show evidence of wetness above a depth of 30 inches.

The Lakeland soils occur on broad flats and in dune-like areas of uplands that are level to moderately sloping or rolling. The more gentle slopes are commonly used for truck crops, especially melons and cucumbers, and for corn and soybeans. Most of the stronger slopes are still in trees, chiefly scrub hardwoods, but there are also considerable amounts of Virginia pine and some loblolly pine in cutover areas and areas of second-growth.

Leon series

The soils of the Leon series are Aeric Normaquods in a sandy, siliceous, thermic family that has a light-colored A horizon and conspicuous ortstein. The B2 horizon is very firm when moist. The Leon soils contain very little silt or clay in the solum and are extremely acid throughout the profile.

Profile of the Leon loamy sand, in a level wooded area, about a quarter of a mile west of the Worcester County line and three-fourths of a mile northwest of Friendship Church:

A1—0 to 8 inches, dark-gray (N 4/0) loamy sand; single grain (structureless); roots fairly abundant; extremely acid; clear, irregular boundary. 3 to 8 inches thick.

A2—8 to 20 inches, gray (5Y 5/1) loamy sand; single grain (structureless); roots fairly common; extremely acid; abrupt, smooth to wavy boundary. 10 to 20 inches thick.

B2h—20 to 42 inches, very dark brown (10YR 2/2) cemented sand to fine sand somewhat streaked with brown (10YR 5/3) in lower part; very firm and brittle when moist or wet, very hard when dry; no roots except in a few fracture lines or softer spots; extremely acid; clear, irregular boundary. 9 to 24 inches thick.

C—42 to 48 inches +, brown (10YR 5/3) sand to fine sand; single grain (structureless); extremely acid.

In Somerset County the Leon soils have only a loamy sand surface layer, but the loamy sand is near the sand-loamy sand boundary in many places. The B and C horizons range from sand to fine sand. The hue of the A horizon ranges from 10YR to 5Y or is neutral. Generally, the A1 horizon has a value of 3 or 4 and a chroma of 0 or 1. The value of the Ap horizon is 4 or 5. The A2 horizon ranges from gray to white and has a value of 5 to 8 and a chroma of 0 or 1. In some profiles there is a transitional B1 horizon up to 3 inches thick between the A2 horizon and the B2h horizon. This B1 horizon most commonly has a hue of 10YR but, in some places, it is somewhat redder and may have a hue of 2.5YR. Value of the B1 horizon is 4 or 5, and chroma is 1 or 2. In most places the chroma of the B2h horizon is 2, but in a few places it is 1. The value of the B2h horizon is generally 2, but in some places it is 3. The C horizon ranges in hue from 10YR to 5Y, in value from 5 to 7, and in chroma from 1 to 3.

The A and C horizons are normally single grained, though in some places the A1 or Ap has very weak, granular structure. The B2h horizon is strongly cemented in most places, but many spots are not cemented or are only weakly cemented when moist. These spots, however, harden when they are exposed to air. The Leon soils are not sticky or plastic in any horizon. In Somerset County the solum ranges from about 20 to 50 inches in thickness, but the average thickness generally is more than 36 inches. In Maryland the Leon soils apparently have a thicker B2h horizon and a thicker solum than they normally have in most other areas.

The Leon soils occur on practically level upland flats or in slight depressions. They generally occur closely with St. Johns soils, which are also Normaquods but have a very dark gray or black A1 horizon. The Leon soils also occur with the Galestown, Lakeland, Klej, and Plummer soils, all of which formed in very sandy siliceous sediments and do not have a horizon of clay accumulation. The Leon soils are somewhat poorly drained and poorly drained, but the Galestown and Lakeland soils are somewhat excessively drained and excessively drained, the Klej soils are moderately well drained, and the Plummer soils are poorly drained.

In Somerset County most of the acreage of Leon soils is still wooded. The principal vegetation includes red maple, other wetland hardwoods, some pond pine and loblolly pine, and in most places an undergrowth of grasses, sedges, holly, and huckleberry. Cultivated spots generally are surrounded by larger areas of other soils more commonly used for crops. The Leon soils have a small acreage in Somerset County and are of little importance to agriculture.

Matapeake series

The soils of the Matapeake series are Alfic Normudults in a fine silty, mixed, mesic family. These soils typically have moderately coarse textured to medium-textured A horizons over silty clay loam B21t and B22t horizons. B2t horizons have a hue of 7.5YR and, at least in some part, a chroma of less than 6. The C horizon is sandy and nonconforming. The Matapeake soils are strongly acid or very strongly acid and in some places are extremely acid in the C horizon.

Profile of the Matapeake fine sandy loam, in a nearly level cultivated area about 900 feet south of Mt. Vernon Road, 1 mile west of its intersection with U. S. Highway No. 13:

Ap—0 to 6 inches, olive-brown (2.5Y 4/4) fine sandy loam; weak, medium, granular structure; slightly hard when dry, very friable when moist, slightly sticky and nonplastic when wet; fine roots plentiful; strongly acid; abrupt, smooth boundary. 5 to 10 inches thick.

A2—6 to 12 inches, yellowish-brown (10YR 5/4) light silt loam containing much fine sand; weak, medium, granular structure and weak, fine, subangular blocky structure; hard when dry, friable when moist, slightly sticky and slightly plastic when wet; fine roots common; strongly acid; clear, smooth boundary. 4 to 8 inches thick.

B21t—12 to 18 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, fine, subangular blocky structure; hard when dry, friable when moist, sticky and slightly plastic when wet; few roots; nearly continuous clay coatings of varying thickness; strongly acid; clear, smooth boundary. 6 to 12 inches thick.

B22t—18 to 30 inches, strong-brown (7.5YR 5/6) light silty clay loam containing much fine sand; moderate, fine, subangular blocky structure; hard when dry, friable when moist, sticky and slightly plastic when wet; few to very few roots; thin but nearly continuous clay coatings on most aggregates; strongly acid; gradual, smooth boundary. 10 to 16 inches thick.

B3—30 to 42 inches, strong-brown (7.5YR 5/6) sandy loam; very weak, fine, subangular blocky structure; slightly hard when dry, very friable when moist, slightly sticky and nonplastic when wet; no roots; very strongly acid; clear, wavy boundary. 0 to 15 inches thick.

IIC—42 to 60 inches +, brownish-yellow (10YR 6/6) loamy sand or loamy fine sand; single grain (structureless); very strongly acid to extremely acid.

In Somerset County the texture of the surface layer is fine sandy loam or silt loam. The B21t and B22t horizons are silty clay loam or silt loam in which the content of clay is more than 18 percent. In most places the silt loam contains less fine sand in the B21t and B22t horizons than does the fine sandy loam. In some places the B3 horizon is lacking, and the B22t is directly over the sandy IIC horizon. Where a B3 horizon occurs, it is transitional between the dominantly silty solum and the sandy IIC horizon. Where the B3 horizon is absent, the B21t and B22t horizons are normally thicker than those described.

The A horizons have a hue of 10YR or 2.5Y. In wooded or other undisturbed areas, the A1 horizon normally has a value of 3 or 4 and a chroma of 2; the Ap horizon has a value of 4 or 5 and a chroma of 2 to 4. Value in the A2 horizon is 5 or 6 and chroma generally is 4. All or part of the B21t and B22t horizons has a hue of 7.5YR, but in some profiles a part of these horizons has a hue of 10YR. Value of the B21t and B22t horizons is normally 5, and chroma is 4 and higher. The B3 horizon has the same color as the B22t, or it is transitional in color to the IIC horizon. The IIC horizon normally has a 10YR or 2.5Y hue and a value and chroma of 4 to 6.

Structure is normally moderate in the B21t and B22t horizons and weak in the other parts of the solum. The A horizon is granular to weak, subangular blocky in structure; the B21t and B22t horizons are invariably subangular blocky. The B21t and B22t horizons are sticky, but in plasticity they vary from slight to moderate.

The Matapeake soils occur on nearly level to strongly sloping uplands, where they formed in silty material, possibly eolian, over older sandy sediments. Also formed in this kind of materials are the somewhat wet Mattapex soils, the gray, wet Othello soils, and the very wet Portsmouth soils. The Matapeake soils are similar to the Sassafras soils in color and in other characteristics but are more silty throughout the solum. In the Matapeake soils the B21t and B22t horizons are silty clay loam, but in the Sassafras soils these horizons are heavy loam or sandy clay loam.

In Somerset County most of the acreage of Matapeake soil is used for crops, including corn, soybeans, various truck crops, and strawberries. Some of the acreage is in pasture. Included in the remaining wooded areas are mixed hardwoods, dominated by oak and, in cutover and second-growth areas, a considerable amount of loblolly pine. The Matapeake soils occupy more than 11,500 acres in the county. Because most of this acreage is intensively farmed, these soils are of great importance to agriculture. They are also important for producing timber and for other uses.

Mattapex series

The soils of the Mattapex series are Aqualfic Normudults, in a fine silty, mixed, mesic family. These soils typically have moderately coarse textured to medium-textured Ap and A2 horizons over a silty clay loam B2t horizon that is mottled in its lower part. Mattapex soils are strongly acid or very strongly acid unless they have been limed.

Profile of the Mattapex silt loam, in a nearly level cultivated area on State Route 667, about 3½ miles northeast of Rehobeth:

Ap—0 to 9 inches, dark-brown (10YR 4/3) light silt loam; weak, medium, granular structure; slightly hard when dry, very friable when moist, slightly sticky and slightly plastic when wet; many fine roots; slightly acid (limed); abrupt, smooth boundary. 8 to 10 inches thick.

A2—9 to 17 inches, yellowish-brown (10YR 5/4) light silt loam; weak, medium to coarse, granular structure; slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; common fine roots; medium acid or strongly acid; clear, wavy boundary. 4 to 8 inches thick.

B21t—17 to 24 inches, light yellowish-brown (10YR 6/4) light silty clay loam; moderate, fine and medium, blocky structure; hard when dry, friable or firm when moist, slightly sticky and plastic when wet; common fine roots; many pores and root channels, the larger ones filled with dark silty material, probably from the Ap horizon; medium acid or strongly acid; clear, wavy boundary. 6 to 12 inches thick.

B22t—24 to 38 inches, light yellowish-brown (10YR 6/4) silty clay loam with many, medium, distinct mottles of yellowish brown (10YR 5/6) and few, medium, faint mottles of light olive gray (5Y 6/2); weak, thin, platy structure and moderate, fine and medium, blocky structure; hard when dry, firm and slightly brittle when moist, sticky and plastic when wet; few fine roots, mostly in upper part; medium acid or strongly acid; clear, wavy boundary. 8 to 20 inches thick.

C1—38 to 46 inches, brownish-yellow (10YR 6/6) loam or light silt loam with common, medium, distinct mottles of yellowish brown (10YR 5/8); massive (structureless); slightly hard when dry, friable when moist, slightly sticky and slightly plastic when wet; very few fine roots; strongly acid or very strongly acid; clear, wavy boundary. 0 to 10 inches thick.

IIC2—46 to 56 inches +, light yellowish-brown (2.5Y 6/4) light fine sandy loam with common, medium, prominent mottles of strong brown (7.5YR 5/8); single grain (structureless); loose when dry, very friable when moist; no roots; strongly acid or very strongly acid.

In Somerset County, the texture of the surface layer is silt loam or fine sandy loam. The B21t and B22t horizons are silt loam or silty clay loam and have a content of clay greater than 18 percent. In most places these horizons in the silt loam have less fine sand than the B21t and B22t horizons in the fine sandy loam. The C1 horizon is lacking in some places, but where it occurs, it is silty. The IIC2 horizon is sandy in all places. All horizons in the solum may contain some fine sand or very fine sand that grades toward medium sand in the IIC2 horizon. The solum ranges from about 28 to 42 inches in thickness.

In wooded or other undisturbed areas the A1 horizon is about 1 to 3 inches thick. The hue throughout the solum is 2.5Y or 10YR. In some profiles both hues occur, 10YR being the hue of the B21t and B22t horizons. The A1 and Ap horizons have a value of 3 or 4 and a chroma that is generally 2 but that ranges from 1 to 3. The A2 horizon normally has a value of about 5 and a chroma of 4. In the B21t and B22t horizons, value is 5 or 6 and chroma is generally 4 to 6 but in a few places is as much as 8. The depth to mottling ranges from about 18 to 24 inches. In some profiles the mottling is grayish at about 10 inches below the top of the B21t horizon. Except in the grayish colors, the chroma of the mottles, and thus their contrast, increases with depth. The C horizon

generally is about the same color as the B21t and B22t horizons, but the IIC2 horizon may be almost any color and in many places is dominated by gray.

Structure is generally moderate in the B21t and B22t horizons and weak in the rest of the solum, though in some places the B22t horizon has weak structure. The A horizon is granular to weak, subangular blocky in structure. In most places the B21t and B22t horizons are blocky, but parts of those horizons may be subangular blocky, and part of the B22t may be platy. The B21t and B22t horizons are normally plastic and fairly sticky, and they tend to be firm, particularly in the B22t horizon.

The Mattapex soils are similar to the Keyport and to the Woodstown soils in color, wetness, and other characteristics. The B21t and B22t horizons in the Mattapex soils are silty clay loam, but those horizons are sandy clay loam or heavy sandy loam in the Woodstown soils and, at least in some parts, are clay or silty clay in the Keyport.

The Mattapex soils occur on nearly level to gently sloping uplands, where they formed in silty material, possibly eolian, over older sandy deposits. This is the same kind of material in which formed the well-drained Matapeake soils, the gray, wet Othello soils, and the very wet Portsmouth soils.

In Somerset County most of the acreage of Mattapex soils is used for crops or pasture. The principal crops are corn, soybeans, truck crops, and strawberries. In wooded areas are hardwoods that tolerate some wetness, including sweetgum, many oaks, and some red maple. Cutover and second-growth areas have sparse to good stands of loblolly pine. The Mattapex soils occupy nearly 12,000 acres in Somerset County and are agriculturally important.

Othello series

The soils of the Othello series are Typic Ochraquults in a fine silty, mixed, mesic family. These soils typically have a medium-textured or moderately fine textured A horizon over a very silty, gleyed B2tg horizon that is rather slowly permeable. The Othello soils are very strongly acid or extremely acid unless they have been limed.

Profile of the Othello silt loam, in a level wooded area on a secondary road, 800 feet south of St. James Church at Oriole:

A1—0 to 2 inches, dark-gray (10YR 4/1) silt loam; moderate, fine, granular structure; slightly hard when dry, friable when moist, slightly plastic and slightly sticky when wet; many fibrous roots and some woody roots; very strongly acid or extremely acid; abrupt, wavy boundary. 1 to 6 inches thick.

A2g—2 to 7 inches, gray (10YR 5/1) silt loam with few, fine, distinct mottles or specks of yellowish brown (10YR 5/8); weak, fine to medium, granular structure; hard when dry, friable or firm when moist, slightly sticky and slightly plastic when wet; very few woody roots but common fibrous roots; very strongly acid or extremely acid; gradual, wavy boundary. 2 to 6 inches thick.

B21tg—7 to 15 inches, gray or light-gray (10YR 6/1) light silty clay loam with many, coarse, distinct mottles of yellowish brown (10YR 5/6); moderate, fine to medium, blocky structure; very hard when dry, firm when moist, sticky and plastic when wet; few woody and fibrous roots; root channels filled with dark-gray silty material; very strongly acid or extremely acid; gradual, wavy boundary. 6 to 12 inches thick.

B22tg—15 to 26 inches, light-gray (N 7/0) silty clay loam with many, medium, prominent mottles of yellowish brown (10YR 5/6); moderate, fine and medium, blocky structure with some tendency toward platy structure; very hard when dry, firm and somewhat brittle when moist, sticky and plastic when wet; few roots; old channels filled with dark-gray silty material; very strongly acid; clear, wavy boundary. 8 to 12 inches thick.

B3g—26 to 32 inches, gray (N 5/0) fine sandy clay loam with common, medium, prominent mottles of yellowish brown (10YR 5/4) and few, fine, prominent mottles of strong brown (7.5YR 5/6); weak, fine, blocky structure; very hard when dry, firm when moist, sticky and plastic when wet; few roots; channels filled with dark-gray silty material; very strongly acid; abrupt, wavy boundary. 0 to 8 inches thick.

IIC—32 to 50 inches +, variegated light brownish-gray (2.5Y 6/2) and grayish-brown (2.5Y 5/2) fine sand; single grain (structureless); very few roots; strongly acid.

In Somerset County the texture of the surface layer is generally silt loam, though in fairly large areas it is light silty clay loam. The B21t and B22t horizons range from heavy silt loam to silty clay loam and have a content of clay between 18 and 35 percent. The soils having a silty clay loam surface layer are finest in texture below the surface layer. In fairly large areas the IIC horizon is replaced by a silt loam C horizon. In these areas the transitional B3g horizon is lacking, and in some places the C horizon is underlain at a great depth by a sandy IIC horizon similar to the one described. The solum in the Othello soils ranges from about 24 to 36 inches or more in thickness.

In cultivated areas the Ap horizon is about 10 inches thick. The hue in the profile ranges from 10YR to 5Y or is neutral. The upper part of the profile generally has a hue of 10YR, but hue becomes yellower or more nearly neutral as depth increases. In the A1 and Ap horizons value normally is 4 or 5 and chroma is 0, 1, or 2. The A2 horizon has a value that is one or two units higher than that of the A1 or Ap horizon. In the B and C horizons the value of the matrix ranges from 5 to 7, and chroma is generally 0 or 1, but in a few places, is 2. The IIC horizon may be of almost any color. Mottling begins at the top of the B21t horizon and, in some profiles, is in the A2. The mottles are mostly 10YR or 7.5YR in hue and 5 or 6 in value. The chroma of the mottles ranges from 2 to 8 but generally is 6. The values given are for a moist soil and are generally 1 unit less than those of a dry soil.

Structure varies from weak to moderate throughout the profile and is strongest in the B21t and B22t horizons. In those horizons structure is mostly blocky but, in some places, it tends to be platy or subangular blocky. The B horizon is normally moderately sticky and moderately plastic.

The Othello soils occur on level to gently sloping uplands and formed in very silty material, possibly in part eolian, over older sandy sediments. This material is the same kind in which also formed the well-drained Matapeake soils, the somewhat wet Mattapex soils, and the very wet Portsmouth soils. The Othello soils are similar to the Fallsington soils in color and in degree of wetness. However, the Othello soils have silty clay loam B21tg and B22tg horizons, whereas those horizons are sandy clay loam or heavy sandy loam in the Fallsington soils.

Most of the acreage of Othello soils in Somerset County supports forests, much of which has been cut over. Some of the acreage is used for crops. The main crops are corn and soybeans, but some truck crops are grown, and there is some pasture. The principal vegetation is water-tolerant hardwoods, including red maple, sweetgum, and various oaks. Mixed to almost pure stands of loblolly pine are in the cutover and second-growth areas.

The Othello series is by far the most extensive series in Somerset County. Othello soils occupy more than 66,000 acres, or more than 30 percent of the land. These soils are not extensively used for agriculture, but they are highly important, particularly in their potential for producing wildlife and wood products.

Plummer series

The soils of the Plummer series are Typic Aquipsamments in a sandy, siliceous, acid, thermic family. These soils typically are coarse textured and are very strongly acid or extremely acid throughout unless they have been limed. They lack a B horizon of any kind and have the gray and mottled colors that indicate long periods of wetness.

Profile of the Plummer loamy sand, in a level wooded area about 2 miles south of the intersection of Somerset, Wicomico, and Worcester Counties, on County Line Road:

A11—0 to 7 inches, grayish-brown (2.5Y 5/2) loamy sand with many white grains of sand; single grain (structureless); roots plentiful; very strongly acid; gradual, wavy boundary. 6 to 8 inches thick.

A12—7 to 10 inches, light brownish-gray (2.5Y 6/2) loamy sand; single grain (structureless); few roots; very strongly acid; clear, irregular boundary. 2 to 5 inches thick.

C1g—10 to 48 inches, light olive-gray (5Y 6/2) loamy sand with few, medium and coarse, distinct mottles of brown (10YR 5/3); single grain (structureless); very few roots; some inclusions of material apparently identical to that of the A12 horizon; some small irregular inclusions of slightly sticky sandy loam; very strongly acid; abrupt, smooth boundary. 30 to 40 inches thick.

IIC2g—48 to 54 inches +, light-gray (5Y 7/1) coarse sand; single grain (structureless); no roots; very strongly acid or extremely acid.

The Plummer soils are coarse textured and structureless throughout the profile. The C1g horizon is loamy sand, sand, or fine sand. The nonconforming IIC2g horizon ranges from coarse sand to sandy loam or sandy clay loam. A finer textured IIC2g horizon generally occurs at a depth of 6 feet or more.

In cultivated areas the plow layer is of about the same color as the A11 horizon. After Plummer soils have been exposed for some time, their surface is dry and is light gray to almost white. The hue of the entire profile centers on about 2.5Y but ranges from 10YR to 5Y and neutral. The A horizon generally has a value ranging from 4 to 6 and a chroma of 0, 1, or 2, but the value of the A horizon may be only 2 or 3 where the A11 horizon is less than 8 inches thick. The C horizon normally has a value of 6 or 7, but the range is from 5 to 8. The chroma of the C horizon is 0, 1, or 2. In some places the C1g horizon is not mottled. Where mottles occur, they are 5Y to 10YR in hue, 5 or 6 in value, and 3 to 8 in chroma. In many places the C horizon is uniformly gray, light gray, or white, and in other places there are variegations of these colors. In places the C horizon is streaked and stratified.

The Plummer soils occur on level or depressional uplands and formed in sand that contains very little silt or clay. Also formed in this kind of material are the Galestown, Lakeland, Leon, and St. Johns soils. The Plummer soils have about the same drainage as the Leon soils but are not so well drained as the Galestown and Lakeland soils. Plummer soils are better drained than the extremely wet St. Johns soils. They occur with the Klej soils, which are not so wet as the Plummer. The Klej soils have a high chroma in the C1g horizon and no mottling above a depth of 15 to 24 inches.

The Plummer soils are of minor extent and importance in Somerset County. Some areas are used for truck crops or soybeans, but most areas support red maple, sweetgum, and various kinds of water-tolerant hardwoods. In many places there is an undergrowth of huckleberry. Some pond pines grow, and there is a considerable amount of loblolly pine in many of the cutover areas.

Pocomoke series

The soils of the Pocomoke series are Typic Umbraquults in a fine loamy, siliceous, thermic family. These soils typically have a moderately coarse textured or medium-textured A1 horizon over finer-textured, gleyed B1g and B2tg horizons that are moderately permeable and very wet. Pocomoke soils are very strongly acid or extremely acid unless they have been limed. In many places the pH is 4.0 or less.

Profile of the Pocomoke sandy loam, in a level wooded area on the west side of Meadow Bridge Road, three-fourths of a mile north of its intersection with Sea Tick Road:

A1—0 to 10 inches, black (10YR 2/1) sandy loam; very weak, fine, granular structure; very friable when moist, slightly plastic and nonsticky when wet; roots plentiful; extremely acid; clear, wavy boundary. 10 to 12 inches thick.

B1g—10 to 14 inches, gray (10YR 5/1) heavy sandy loam; weak, fine, blocky structure; friable when moist, slightly sticky and slightly plastic when wet; few roots; strongly acid or very strongly acid; gradual, smooth boundary. 4 to 8 inches thick.

B2tg—14 to 28 inches, gray or light-gray (10YR 6/1) heavy sandy loam with common, medium, distinct mottles of yellowish brown (10YR 5/6); weak, fine to medium, blocky structure; firm when moist, slightly sticky and plastic when wet; a very few roots; very strongly acid or extremely acid; abrupt, wavy boundary. 10 to 18 inches thick.

IICg—28 to 50 inches +, gray or light-gray (5Y 6/1) loamy sand with few, coarse, prominent mottles of yellowish brown (10YR 5/6); single grain (structureless); very few roots; some inclusions of white (5Y 8/1) sand; very strongly acid or extremely acid.

In Somerset County the texture of the surface layer is loam or sandy loam. B1g and B2tg horizons are heavy sandy loam or sandy clay loam and typically have a content of clay that is more than 18 percent. In only a few places, if any, does a conforming C horizon occur. The IIC horizon is coarser in texture than any part of the solum, and in places contains fine gravel. The solum ranges from about 20 to 30 inches in thickness.

Locally in wooded areas, the surface layer is somewhat mucky. In some cultivated areas the Ap horizon has a value of 3 and a chroma of 0 to 2. Normally the A1

horizon is black. It ranges in hue from 5YR to neutral and has a value of 2 and a chroma of 0 or 1. Below the A1 horizon, the matrix has a hue of 10YR to neutral, a value that ranges from 4 to 7 but is generally 5 or 6, and a chroma that generally is 0 or 1 but is 2 in a few places. In most places the mottles in the B horizon are high in contrast and have a value of 5 and a chroma of 6 to 8. In some place, however, the B horizon has grayish mottles of low chroma, and in other places it is gray or variegated gray and there is little or no mottling. The values given are for a moist soil and are generally one unit less than those of a dry soil.

In places where the surface layer is sandy clay loam, structure is weak to moderate in the B1g and B2tg horizons. In some places part of the A1 horizon has moderate, granular structure. The B1g and B2tg horizons have subangular blocky structure in some places. These horizons are plastic and slightly sticky or moderately sticky.

The Pocomoke soils occur on practically level uplands where they formed in moderately clayey and silty sand over very sandy sediments. Also formed in this kind of material are the Sassafras, Woodstown, Dragston, and Fallsington soils. The Sassafras soils show no evidence of wetness; the Woodstown soils are slightly wet; the Dragston soils are moderately wet; and the Fallsington soils are wet but less so than the Pocomoke. Although they are somewhat similar to the Portsmouth soils, the Pocomoke soils have B1g and B2tg horizons of moderately permeable sandy loam or sandy clay loam, whereas in the Portsmouth soils those horizons are more slowly permeable silty clay loam.

Where they have been artificially drained, the Pocomoke soils are used for crops, especially corn and soybeans. Some truck crops are grown, and there are some pastures. Large areas, however, are still in wetland hardwoods, notably red maple, gum, holly, and various oaks. Pond pines grow in some places, and in cutover and second-growth areas, loblolly pine are scattered or are in almost pure stands. The Pocomoke soils occupy 8,000 acres in this county; they are important to agriculture and for wood products and wildlife habitats.

Portsmouth series

The soils of the Portsmouth series are Typic Umbraquults in a fine loamy, siliceous, thermic family. These soils typically have a medium-textured A horizon over moderately fine textured, gleyed B2tg and B3g horizons that are slowly permeable and wet. The Portsmouth soils are very strongly acid to extremely acid unless they have been limed. In many places the pH is 4.0 or less.

Profile of the Portsmouth silt loam, in a level cultivated area on the east side of Cottage Grove Road, about half a mile south of its intersection with U.S. Highway No. 13:

A1p—0 to 10 inches, very dark brown (10YR 2/2) silt loam; very weak, fine, granular structure; very friable when moist, slightly sticky and slightly plastic when wet; common roots; strongly acid (probably limed); clear, smooth boundary. 10 to 12 inches thick.

A12g—10 to 17 inches, dark-gray (10YR 4/1) silt loam with few, medium, faint mottles of dark brown (10YR 4/3); weak, medium, granular structure; friable when moist, slightly sticky and slightly plastic when wet; few fine roots; very strongly acid; clear, wavy boundary. 5 to 8 inches thick.

B2tg—17 to 26 inches, gray or light-gray (5Y 6/1) heavy silty clay loam with many, fine, distinct mottles of yellowish brown (10YR 5/6); moderate, fine, blocky and subangular blocky structure; firm when moist, sticky and plastic when wet; few fine roots; root channels lined with brown; extremely acid; clear, wavy boundary. 8 to 12 inches thick.

B3g—26 to 30 inches, light brownish-gray (2.5Y 6/2) fine sandy loam with many, medium, distinct mottles of brownish yellow (10YR 6/6) and few, medium, faint mottles of grayish brown (2.5Y 5/2); almost structureless; friable when moist; nonsticky and nonplastic when wet; very few fine roots; root channels lined with brown; very strongly acid; clear or abrupt, wavy boundary. 0 to 6 inches thick.

IICg—30 to 40 inches +, grayish-brown (2.5Y 5/2) sand with some thin streaks of light olive brown (2.5Y 5/6); single grain (structureless); no roots; about 1 percent fine gravel; very strongly acid.

In Somerset County the texture of the A horizon is loam or silt loam. The B2tg and B3g horizons are silty clay loam in at least some part, and no part of those horizons is finer textured. In some places the B3g horizon is sandy clay loam that grades to the C horizon. The content of clay of the B2tg and B3g horizons is between 18 and 35 percent. The IIC horizon is coarser textured than any part of the solum and in some places contains gravel. In Somerset County the solum ranges from about 24 to 36 inches in thickness.

In wooded or other undisturbed areas, the A1 horizon is black, is at least 8 inches thick, and locally is somewhat mucky. The Ap horizon is gray or brown only in areas that have been cultivated for considerable periods. The A1 horizon has a value of 2 and a chroma of 0 or 1. In some places the Ap horizon has a value of 2 or 3 or, in a few places 4, and a chroma of 0, 1, or 2. The hue below the A horizon is generally 5Y but is 2.5Y or neutral in some places.

In a moist soil, the matrix of the B2tg horizon has a value of 4 to 6 and a chroma no higher than 1. The IIC horizon is variable in color but is gleyed in all places. In color the B3g horizon is transitional between the B2t and the IIC. In some places the B and C horizons are not mottled. Most mottling has a hue of 10YR or 2.5Y, a value of 5 or 6, and a chroma of 2 to 6. In a dry soil, value generally is one unit higher than that in a moist soil.

Structure is weak to moderate in the B2tg horizon. That horizon is mostly blocky, but some aggregates are subangular. The B2tg horizon is sticky and plastic, but in most places not highly so.

The Portsmouth soils occur on almost level uplands and formed in silty material, possibly in part eolian, over older sandy sediments. Also formed in this kind of material are the Matapeake, Mattapex, and Othello soils. The Matapeake soils show no evidence of wetness; the Matapex soils are somewhat wet; and the Othello soils are wet and have a gray instead of a black A horizon. The Portsmouth soils are similar to the Pocomoke soils, but the B2tg horizon of the Portsmouth soils differs from that of the Pocomoke soils in texture. In the Portsmouth soils at least part of the B2tg horizon is slowly permeable silty clay loam, and in the Pocomoke soils the B2tg hori-

zon is moderately permeable sandy loam or sandy clay loam.

Artificially drained areas of Portsmouth soils are used for some crops, chiefly corn and soybeans. In Somerset County, however, most areas of these soils are in forest dominated by wetland hardwoods. These trees include red maple, gum, and water-tolerant oaks, and the undergrowth is holly, huckleberry, and briars. Some pond pines generally occur, and in a few places there are some cypress trees. Many cutover and second-growth areas have been invaded by loblolly pine.

The Portsmouth soils occupy about 14,000 acres in Somerset County. They are not widely used for farming, but they could be cultivated if they were drained. Also, they could be more intensively used for producing timber and other wood products.

St. Johns series

The soils of the St. Johns series are Typic Normaquods in a sandy, siliceous, thermic family that has conspicuous ortstein. These soils typically have a leached A2 horizon underlain by a B horizon that is very firm or extremely firm when moist. The St. Johns soils contain very little silt or clay in the solum and are very strongly acid or extremely acid throughout the profile unless they have been limed.

Profile of the St. Johns loamy sand, in a level wooded area about three-fourths of a mile northwest of Friendship Church:

A1—0 to 8 inches, black (5Y 2/1) loamy sand; very weak, fine, granular structure; loose when dry, very friable when moist; roots fairly abundant; many clean sand grains, white against black background; extremely acid; clear, wavy boundary. 8 to 10 inches thick.

A2—8 to 18 inches, dark-gray (5Y 4/1) loamy sand or loamy fine sand; single grain (structureless); roots fairly common; extremely acid; abrupt, smooth to wavy boundary. 4 to 12 inches thick.

B2h—18 to 24 inches, dark reddish-brown (5YR 2/2) loamy sand or fine sand; massive; cemented, very firm or extremely firm when moist or wet, and very brittle; practically no roots; extremely acid; clear, irregular boundary. 4 to 10 inches thick.

B3h—24 to 33 inches, dark-brown (7.5YR 4/2) fine sand; single grain (structureless); no roots; organic coatings on sand grains; extremely acid; gradual, irregular boundary. 3 to 12 inches thick.

C1—33 to 42 inches, brown (7.5YR 5/4) fine sand; single grain (structureless); no roots; extremely acid; gradual, wavy to irregular boundary. 6 to 12 inches thick.

C2—42 to 48 inches +, pale-brown (10YR 6/3) fine sand; single grain (structureless); no roots; extremely acid.

In Somerset County the surface layer is loamy sand that, in many places, is near the sand-loamy sand boundary. The B and C horizons consist of sand that grades into fine sand. In some places the B horizon is somewhat loamy. The hue of the entire profile ranges from 5Y to 5YR. The A1 horizon is black and in some places is mucky at the surface. The Ap horizon is black or very dark gray. The A2 horizon has a value of 4 to 7 and a chroma generally of 0 to 1. The B2h horizon has a value and a chroma of 2 in most places, but chroma is 1 in some places. The B3h horizon has a value two and three units higher than that of the B2h horizon. The C horizon is more variable in color than the B horizon and has a value of 4 to 7 and a chroma of 2, 3, or 4, and, in some places, as much as a 6.

The A, B3h, and C horizons normally are single grain, though the A1 or Ap horizon has very weak, granular structure in some places. The B2h horizon is mostly strongly cemented, but in places it is not cemented or is only weakly cemented. In these places, however, the B2h horizon hardens if it is exposed. The St. Johns soils are neither sticky nor plastic in any horizon. In Somerset County the solum ranges from about 24 to 40 inches in thickness, but the average generally is 30 to 36 inches.

The St. Johns soils are on upland flats or in slight depressions. They generally occur closely with the Leon soils, which are also Normaquods, but are not so wet as the St. Johns soils. The St. Johns soils also occur with the Galestown, Lakeland, Klej, and Plummer soils. All of those soils, including the St. Johns, formed in very sandy, siliceous sediments, but only the St. Johns soils have a B horizon. The St. Johns soils are wetter than any of those soils. The Galestown and Lakeland soils show no evidence of wetness. Mottling in the lower part of the Klej soils indicates some wetness. The Plummer soils are quite wet; they are gray throughout and generally are considerably mottled in the lower part of the profile.

In Somerset County the St. Johns soils are almost entirely wooded; for only a few spots have been cleared. The principal vegetation consists of red maple and pond pines. Holly, gum, and other hardwoods occur, and in places there are loblolly pines. The spots that are cultivated are normally surrounded by larger areas of other soils that are more commonly used for crops. In Somerset County the St. Johns soils are of small extent and are of little importance to agriculture.

Sassafras series

The soils of the Sassafras series are Alfic Normudults in a fine loamy, siliceous, mesic family. These soils typically have a moderately coarse A horizon over a sandy clay loam or heavy sandy loam B2t horizon that is moderately permeable and has a chroma of less than 6 in at least some parts. These soils are strongly acid or very strongly acid unless they have been limed.

Profile of the Sassafras sandy loam, in a nearly level cultivated area about half a mile east of Trinity Ferry and a quarter of a mile south of Wicomico Creek:

Ap—0 to 12 inches, dark grayish-brown (10YR 4/2) light sandy loam; weak, fine to medium, granular structure; very friable when moist, slightly sticky and very slightly plastic when wet; many fine roots; neutral (heavily and regularly limed); abrupt, wavy boundary. 10 to 12 inches thick.

A2—12 to 18 inches, yellowish-brown (10YR 5/4) sandy loam; weak, very fine, granular structure; very friable when moist, slightly sticky and slightly plastic when wet; few fine roots; neutral, gradual, wavy boundary. 4 to 8 inches thick.

B21t—18 to 23 inches, dark yellowish-brown (10YR 4/4) light sandy clay loam; weak, medium, blocky structure; friable when moist, slightly sticky and slightly plastic when wet; no roots; abundant fine pores and some medium pores; neutral; diffuse boundary. 5 to 10 inches thick.

B22t—23 to 32 inches, yellowish-brown (10YR 5/6) light sandy clay loam; moderate, medium, blocky structure; friable to slightly firm when moist, sticky and

slightly plastic when wet; no roots; some fine pores and many medium pores; discontinuous dark yellowish-brown (10YR 4/4) clay coatings in pores on aggregates; medium acid or slightly acid; clear, irregular boundary. 9 to 12 inches thick.

C—32 to 50 inches +, pale-brown (10YR 6/3) loamy sand; structureless; very friable when moist, nonsticky and nonplastic when wet; no roots; a few ovoid to spherical inclusions, up to 2 inches in greatest dimension, of material apparently identical with that of the B22t horizon; medium acid.

In Somerset County the texture of the surface layer is sandy loam. B21t and B22t horizons are generally heavy sandy loam or sandy clay loam but are loam in some places. These horizons have a content of clay between 18 and 35 percent. Some profiles have a thin, transitional B1 or B3 horizon, or both. The C horizon is a loamy sand or sandy loam.

In wooded or other undisturbed areas, the A1 horizon is up to about 4 inches thick and the A2 is thicker than that described. The hue of the A horizon is 10YR in most places. The A1 horizon generally has a value of 3 and a chroma of 2. Value of the Ap horizon is generally 4 or 5, and chroma is 2. The A2 horizon normally has a value of 5 or 6 and a chroma of 3 or 4. The B21t and B22t horizons have a hue of 10YR or 7.5YR, a value of 4 or 5, and a chroma of 4 to 6. The chroma of the B21t and B22t horizons typically is 4 in at least some part of the horizons; a chroma of less than 6 generally occurs with a hue of 10YR. The C horizon generally has a hue of 10YR, a value of 5 or 6, and a chroma of 3 to 6.

Structure is weak or moderate in the B21t and B22t horizons and generally is weak in the rest of the solum. In most places the B21t and B22t horizons have some subangular blocky structure, as well as blocky. The finest part of these horizons is usually sticky, but in only a few places in Somerset County these horizons are more than slightly plastic.

The Sassafras soils formed in moderately silty and clayey sand on level to rather strongly sloping uplands. Also formed in this kind of material are the slightly wet Woodstown soils, the moderately wet Dragston, the wet Fallsington soils, and the very wet Pocomoke soils. The Sassafras soils are similar to the Matapeake soils in color and in drainage but are less silty throughout the solum. Sandy clay loam or heavy sandy loam B21t and B22t horizons are characteristic of the Sassafras soils, but those horizons are silty clay loam in the Matapeake soils.

The Sassafras soils are highly valued for crops in Somerset County, and most of their acreage is cultivated. The principal crops are soybeans, corn, strawberries, sweetpotatoes, and truck crops. Improved pastures are few. In wooded areas upland hardwoods, particularly oaks, dominate, but mixed to almost pure stands of loblolly pine grow in cutover and second-growth areas and, locally, there are some Virginia pines. The Sassafras soils do not have a large acreage in Somerset County, but they are intensively used and are important agriculturally.

Woodstown series

The soils of the Woodstown series are Paraquic Normudults in a fine loamy, siliceous, mesic family. These soils are mottled in the lower part of the B horizon. They typically have a moderately coarse textured to medium-textured A horizon over sandy clay loam or heavy sandy loam B21t and B22t horizons that show some evidence of wetness in the lower part. The Woodstown soils are strongly acid or extremely acid unless they have been limed.

Profile of the Woodstown sandy loam, in a nearly level wooded area on the north side of Perryhawkin Road, about 1¾ miles southeast of its intersection with West Post Office Road:

A1—0 to 3 inches, dark-gray (10YR 4/1) sandy loam; weak, fine and medium, granular structure; very friable when moist, nonsticky and nonplastic when wet; roots abundant; very strongly acid; abrupt, smooth boundary. 2 to 3 inches thick.

A2—3 to 10 inches, yellowish-brown (10YR 5/4) sandy loam; weak, medium, granular structure; friable when moist, slightly sticky and slightly plastic when wet; roots fairly plentiful; strongly acid; clear, wavy boundary. 6 to 10 inches thick.

B21t—10 to 18 inches, light olive-brown (2.5Y 5/4) heavy sandy loam; weak, fine, subangular blocky structure; friable when moist, slightly sticky and slightly plastic when wet; common roots; strongly acid or very strongly acid; gradual, wavy boundary. 6 to 12 inches thick.

B22t—18 to 24 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam with common, medium, faint mottles of yellowish brown (10YR 5/6), gray (2.5Y 6/2) in lower part; weak, fine and medium, blocky structure; friable and somewhat firm when moist, slightly sticky and plastic when wet; few roots; some light olive-brown (2.5Y 5/4) and yellowish-brown (10YR 5/4) clay coatings; very strongly acid; gradual, wavy boundary. 5 to 10 inches thick.

B3g—24 to 36 inches, light brownish-gray (2.5Y 6/2) sandy loam with common, medium, distinct mottles of yellowish brown (10YR 5/6); very weak, fine and medium, blocky structure; friable when moist, slightly sticky and slightly plastic when wet; very few roots; very few thin clay coatings in upper part; strongly acid or very strongly acid; abrupt, smooth boundary. 4 to 14 inches thick.

IIC—36 to 50 inches +, yellowish-brown (10YR 5/6) loamy sand with common, medium and coarse, distinct mottles of pale olive and light gray (5Y 6/3 and 7/1); single grain (structureless); no roots; very strongly acid.

In Somerset County the texture of the surface layer is loam or silt loam. The B21t and B22t horizons are heavy sandy loam or sandy clay loam. These horizons typically have a content of clay between 18 and 35 percent. The texture of the nonconforming IIC horizon varies, but most commonly that horizon is coarser than the solum. In places the B3g horizon is replaced by a C horizon that is structureless and has no clay coats, but otherwise it is much like the B3g horizon described.

In some cultivated areas all of the natural A2 horizon may have been mixed into the Ap horizon. In most places the entire solum has a hue of 2.5Y, but in some places the hue of the A horizon is 10YR. The A1 horizon normally has a value of 3 or 4 and a chroma of 1 or 2. Value in the Ap horizon normally is one or two units higher than that in the A1 horizon, and the chroma may be as much as 3. The A2 horizon has a value of 5 or 6 and a chroma of 4 in most areas. In the matrix the B21t and B22t horizons have a value of 5 or 6 and a chroma of 4 to 6. The contrast of the mottles is generally low but, in some places, is moderate in the lower horizons. Depth to mottling is generally from 18 to 24 inches but may be as little as 15 inches and as much as 30 inches. No gray mottling

occurs in the upper 10 inches of the B21t and B22t horizons. The IIC horizon varies greatly in color and is strongly gleyed in some places.

Structure is weak to moderate, especially in the B21t and B22t horizons. Some part of these horizons generally is sticky, plastic, or both.

The Woodstown soils formed in moderately silty and clayey sand on level to gently sloping uplands. Also formed in that kind of material are the Sassafras, Dragston, Fallsington, and Pocomoke soils. The Sassafras soils show no evidence of wetness; the Dragston soils are somewhat wetter than the Woodstown soils; the Fallsington soils and the Pocomoke soils are much wetter than the Woodstown soils. The Woodstown soils are similar to the Keyport and Mattapex soils in color, wetness, and other characteristics, but Woodstown soils differ from those soils in texture of the B21t and B22t horizons. The Woodstown soils have sandy loam to sandy clay B21t and B22t horizons, whereas those horizons are silty clay loam in the Mattapex soils and are clay or silty clay in the Keyport soils, at least in some part.

Fairly large areas of Woodstown soils are used for crops, but many areas are still wooded. The principal crops are corn and soybeans, but some truck crops are also grown. The main trees in wooded areas are mixed hardwoods, mostly oaks, but there are some red maple, holly, and other water-tolerant trees. Loblolly pines are fairly common, particularly in cutover areas and in areas of second growth. Although Woodstown soils occupy only a moderate acreage in Somerset County, locally they are important for farming and for producing trees.

Glossary

AASHO classification (soil engineering). The system of classification of soils and soil-aggregate mixtures for highway construction that is used by the American Association of State Highway Officials (*1*).

Aggregate, soil. A structural unit consisting of primary soil particles held together by internal force. (A clod, crumb, block, or prism.)

Alluvial soil. A soil on a flood plain, consisting of alluvium.

Alluvium. Fine material, such as sand, silt, or clay, that has been deposited on land by streams.

Base (chemistry). Any of the positive, generally metallic elements or combinations of elements, that make up the nonacid plant nutrients. The most important of these in plant nutrition are calcium (Ca), potassium (K), magnesium (Mg), and ammonium (NH_4).

Base exchange capacity. The measure of the total amount of bases that can be held by the soil.

Boundary drainage. A ditch or tile line generally placed at a boundary between fields, between open fields and woods, or between two different soils, one of which is more poorly drained than the other.

Clay. As a soil separate, the mineral particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent; soil does not hold together in a mass.

Friable.—When moist, soil crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, soil crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, soil readily deformed by moderate pressure but can be pressed into a lump; forms a wire when rolled between thumb and forefinger.

Sticky.—When wet, soil adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, soil moderately resistant to pressure; difficult to break between thumb and forefinger.

Soft.—When dry, soil breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Contour tillage. Furrowing and other farming operations kept at a level line, generally at comparatively close intervals, and at right angles to the direction of the slope. This practice helps to conserve soil and water on sloping soils.

Cover crop. A close-growing crop, such as grass or clover, grown primarily to improve and to protect the soil between periods of regular crop production; or a crop grown between trees and vines in orchards and vineyards.

Cropland. Land regularly used for crops, except forest crops and permanent pasture. It includes rotation pasture, cultivated summer fallow, orchards, and other land ordinarily used for crops but temporarily idle.

Diversion. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and, thus, to protect areas downslope from the effects of such runoff.

Eluviation. The removal of fine soil material, generally clay, from one place to another within the soil, generally the A horizon, by the downward or lateral movement of water through the soil.

Erosion, soil. The wearing away of the land surface by wind, running water, and other geological agents. *Accelerated erosion* refers to the loss of soil material brought about by the activities of man. Soil erosion in Somerset County is most commonly caused by water and can be classified as *sheet erosion* (the removal of soil material without the development of conspicuous channels), *rill erosion* (accelerated erosion by water that produces small channels), and *gully erosion* (accelerated erosion that produces large channels).

Family (new classification system). Soils that are differentiated within the subgroup on the basis of properties important to the growth of plants. The differentiae vary from subgroup to subgroup. A family name consists of a series of adjectives modifying the subgroup name. These adjectives may describe texture, mineralogy, reaction, temperature, permeability, thickness, slope, consistence, and coatings on peds. Following are the adjectives used in this report to describe textural classes for family groupings:

Sandy.—Sands and loamy sands coarser than loamy very fine sand.

Coarse loamy.—Coarse sandy loam, sandy loam, fine sandy loam, loam, loamy very fine sand, and silt loam.

Fine loamy.—Coarse sandy loam, sandy loam, fine sandy loam, loam, very fine sandy loam, silt loam, sandy clay loam, clay loam, and silty clay loam.

Fine silty.—Very fine sandy loam, silt loam, silty clay loam, loam, and clay loam.

Clayey.—Clay loam, silty clay loam, clay, silty clay, and sandy clay. Following are the mineralogy classes for family groupings used in this report:

Siliceous.—More than 95 percent quartz, chert, and other form of SiO_2 in the fine earth (smaller than 2 millimeters); and between 65 percent and 95 percent quartz, chert, and other forms of SiO_2 if less than 12 percent of the clay fraction of the fine earth is free sesquioxide.

Mixed.—In soils with texture coarser than clayey, more than 40 percent glass, feldspar, mica, and other weatherable minerals of silt and sand size, and silicate clay minerals, but excluding free oxides, and with less than 40 percent of any one mineral; also, free sesquioxides are less than 12 percent of the silicate clay.

Following are the temperature classes for family groupings used in this report:

Mesic.—Soils with 9° or more difference between mean summer and mean winter temperatures, and with a mean annual temperature of 47° to 59°.

Thermic.—Soils with 9° or more difference between mean summer and mean winter temperatures, and with a mean annual temperature of more than 59°.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical condition (or tilth) of the soil, are favorable.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. Nearly level land consisting of stream sediments that borders a stream and is subject to flooding unless protected artificially.

Genesis, soil. The origin of a soil. In its genesis, a soil develops a solum, or A and B horizons, from unconsolidated parent material.

Gleization, or gleying. The reduction, translocation, and segregation of soil compounds, notably of iron, usually in the subsoil or substratum, as a result of poor aeration and drainage; expressed in the soil by mottled colors dominated by gray. The soil-forming processes leading to the development of a gley soil.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Gravelly soil material. From 15 to 50 percent of material by volume, consists of rounded or angular fragments of rock that are not prominently flattened and are up to 3 inches in diameter. A single piece is a *pebble*. The term "gravel" refers to a mass of pebbles.

Horizon, soil. A layer of soil, approximately parallel to the surface that has distinct characteristics produced by soil-forming processes and that differs in one or more ways from adjacent horizons in the same profile. Horizons of the new classification system have word names that are listed in this Glossary in alphabetic order. Soil horizons designated by capital letters are defined as follows:

A horizon.—The mineral horizon at the surface. It contains an accumulation of organic matter, has been leached of soluble minerals and clay, or shows the effects of both.

B horizon.—The horizon in which clay minerals or other material have accumulated or that has developed a characteristic blocky or prismatic structure, or that shows the effects of both processes.

C horizon.—The unconsolidated material immediately under the true soil. In chemical, physical, and mineral composition it is presumed to be similar to the material from which at least part of the overlying solum has developed, unless the C designation is preceded by a Roman numeral.

Roman numerals are prefixed to the master horizon or layer designation (A, B, C, R) to indicate lithologic discontinuities either within or below the solum. The first, or uppermost, material is not numbered, for the Roman numeral I is understood; the second, or contrasting, material is numbered II, and others are numbered III, IV, and so on, consecutively downward. Thus for example, a sequence from the surface downward might be A1, B1, B2, C, IIC2.

Following are the small-letter symbols that may be a part of a horizon designation (B21tg), and the meaning of these symbols.

g—strong gleying.
h—illuvial humus.
p—plow layer.
t—illuvial clay.

Illuviation. The accumulation of material in a soil horizon through the deposition of suspended material and organic matter removed from horizons above. Since part of the fine clay in the B horizon (or subsoil) of many soils has moved into this horizon from the A horizon above, the B horizon is called an illuvial horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Interceptor. A drainage ditch or tile line, generally at or near the base of a slope, to protect areas downslope from the effects of seepage water.

Leaching. The removal of soluble material from soils or other material by percolating water.

Leaf mold. Partly decomposed organic forest litter that is composed mostly of leaves but includes some twigs and other coarser material.

Liquid limit. The moisture content at which a soil material passes from a plastic to a liquid (free-flowing) state. In engineering, a high liquid limit indicates that the soil has a high content of clay and a low capacity for supporting loads.

Lister planting. Planting with drills on the lister plow in the same operation that a field is plowed.

Loess. Wind-transported, fine-textured material that is uniform and unstratified and is dominantly silt but contains some fine sand and clay.

Marine deposit. Material deposited in the waters of oceans and seas and exposed by the elevation of the land or by the lowering of the water level.

Maximum density. The greatest amount of soil that can be compacted into any unit of volume; expressed as pounds of dry soil per cubic foot.

Mechnical analysis of soils. The determination of the percentage of the soil particles of all sizes—gravel, sand, silt, clay, and all their standard subdivisions; based on the mineral soil only, free of water and organic matter.

Minimum tillage. The least amount of tillage required for the preparation of a seedbed and the control of weeds.

Morphology, soil. The physical constitution of the soil, including the texture, structure, consistence, porosity, color, and other physical, chemical, mineralogical, and biological properties of the various horizons that make up the soil profile.

Mottled. Irregularly marked with spots of different color that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse;* and contrast—*faint*, *distinct*, and *prominent*. The size measurements are these: *fine*, less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium*, ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse*, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Munsell notation. A system for designating color by degrees of three simple variables—hue, value, and chroma. For example, the notation 10YR 6/4 stands for a color with a hue of 10YR, a value of 6, and a chroma of 4. Hue is the dominant spectral color; value relates to the relative lightness of color; chroma is the relative purity or strength of color and increases as grayness decreases.

Normal soil. A soil having a profile in equilibrium or in near equilibrium with its environment; developed under good but not excessive drainage and from parent material of mixed mineral, physical, and chemical composition. Its characteristics show the full effects of the forces of climate and living matter.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in making food and tissue. Plant nutrients obtained from the soil include nitrogen, phosphorus, calcium, potassium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps others. Carbon, oxygen, and hydrogen are obtained largely from air and water.

Parent material. The weathered rock or partly weathered soil material from which a soil has formed; the C horizon.

Percolation. The downward movement of water through the soil.

Permeability, soil. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *very slow*, *slow*, *moderately slow*, *moderate*, *moderately rapid*, *rapid*, and *very rapid*.

Phase, soil. A subdivision of a soil type, series, or other unit in the soil classification system made because of differences in the soil that affect its management but do not affect its classification in the natural landscape. A soil type, for example, may be divided into phases because of differences in slope, stoniness, thickness, or some other characteristic that affects management.

pH value. A numerical designation of relative weak acidity and alkalinity in soils and in other biological systems. See Reaction.

Poorly graded soil. A soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles in poorly graded soil material, density can be increased only slightly by compaction.

Pore space. That fraction of the total space in a soil that is not occupied by solid particles.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material. See Parent material and Horizon, soil.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed either in pH values or in words, as follows:

	pH		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4 to 7.8
Very strongly acid	4.5 to 5.0	Moderately alkaline	7.9 to 8.4
Strongly acid	5.1 to 5.5	Strongly alkaline	8.5 to 9.0
Medium acid	5.6 to 6.0	Very strongly alkaline	9.1 and higher
Slightly acid	6.1 to 6.5		
Neutral	6.6 to 7.3		

Relief. The elevations or inequalities of a land surface, considered collectively.

Runoff. The removal of water by flow over the surface of the soil. The amount and rapidity of surface runoff are affected by the texture, structure, and porosity of the surface layer, by the vegetative covering, by the prevailing climate, and by the slope. The rate of surface runoff is expressed as follows: *very rapid, rapid, medium, slow, very slow,* and *ponded.*

Sand. As a soil separate, individual rock or mineral fragments 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz, but they may be of any mineral composition. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

Sediments. Rock, mineral, or soil particles of any size, transported and deposited by water, wind, ice, or gravity.

Series, soil. A group of soils that developed from a particular type of parent material and having genetic horizons that, except for the texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Slope gradient (soil). The gradient of a particular slope expressed in terms of percentage. It is the difference in elevation, in feet, between two points 100 feet apart horizontally.

Soil. The natural medium for the growth of land plants on the surface of the earth; composed of mineral and organic material.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in a mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life charcteristic of the soil are largely confined to the solum.

Stratified. Composed of, or arranged in, strata, or layers such as stratified alluvium. The term is confined to geological material. Layers in soils that result from the processes of soil formation (genetic layers) are called horizons; those inherited from the parent material are called strata.

Stripcropping. Growing crops in a systematic arrangement of elongated narrow strips or bands; the crop on any one strip is generally different from the crop on the adjacent strips. Strips may be laid out independent of the topography (field strips) or more commonly so that the longer part of the strip is at the same elevation or is level throughout, with the rows, if any, laid out at right angles to the direction of the slope (contour strips). See Contour tillage.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *angular blocky* (prisms with sharp corners), *subangular blocky* (prisms with mostly rounded corners), *granular* (granules relatively nonporous), *crumb* (similar to granular but very porous). *Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering without any regular cleavage, as in many claypans and hardpans).

Subgrade (engineering). The substratum, consisting of in-place material or fill material, that is prepared for highway construction; does not include stablized base course or actual paving material.

Subsoil. In many soils, the B horizon of a soil; commonly, that part of the profile below plow depth.

Substratum. Any layer lying beneath the solum or B horizon; the C or R horizon.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 10 inches. The plowed layer.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "course," "fine," or "very fine."

Topography. The elevations or inequalities of the land surface, the slope gradient, and the pattern of these.

Topsoil. Presumably fertile soil or soil material, ordinarily rich in organic matter, that is used to topdress roadbanks, gardens, parks, and lawns.

Type, soil. A subdivision of the soil series based on the texture of the surface layer.

Unified soil classification system (engineering). The system of mechanical soil classification of the Corps of Engineers, Department of the Army (*13*). Used by the Soil Conservation Service and other agencies that use soils in construction.

Upland (geologic). Land consisting of material unworked by water in recent geologic time and ordinarily lying at a higher elevation than the alluvial flood plain or stream terrace. Land above the lowlands along rivers.

Water table. The upper limit of the part of the soil that is seasonally saturated with water; does not refer to the temporary saturation level during and immediately following rains and thaws.

Well-graded soils. A soil or soil material consisting of particles that are well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

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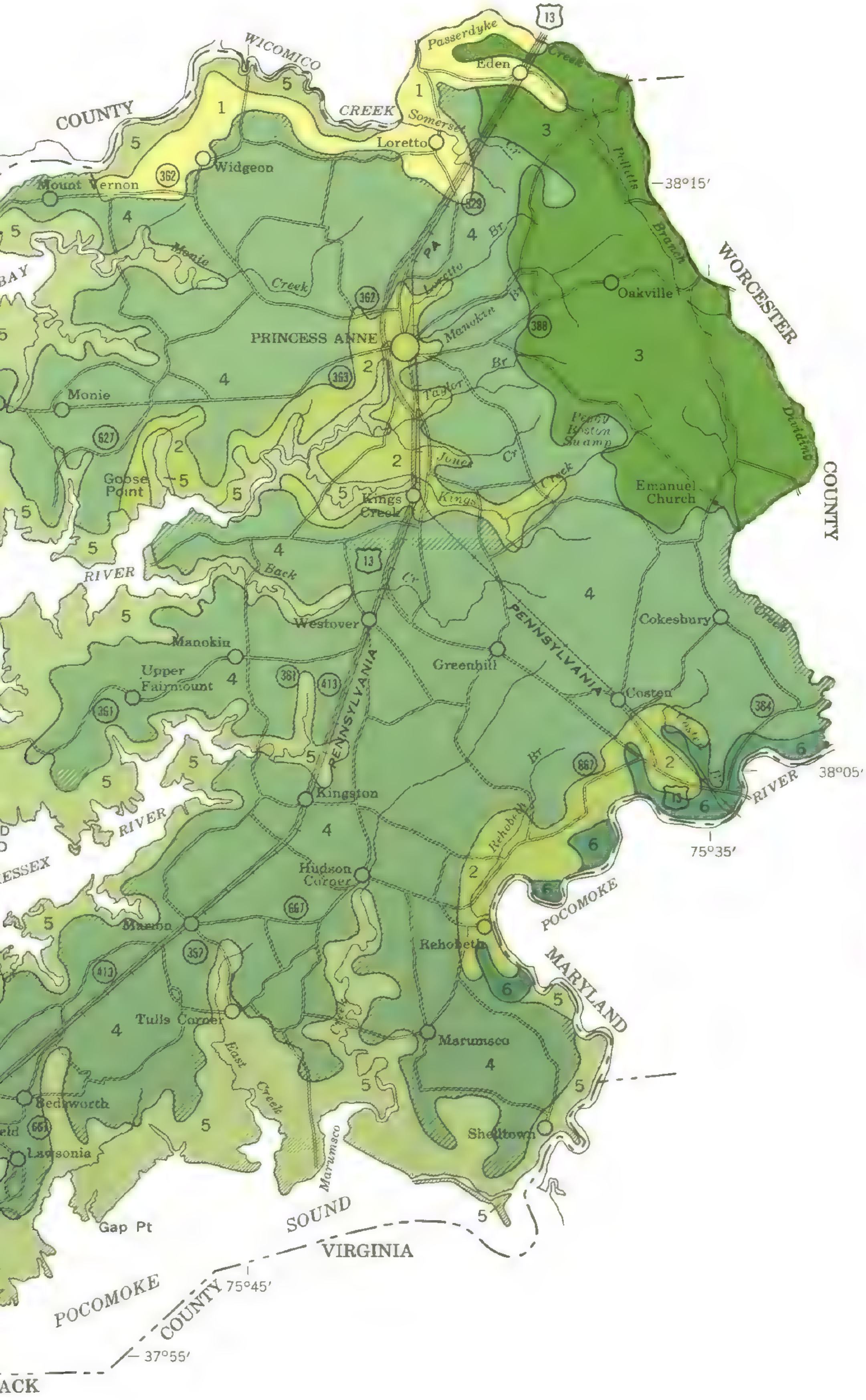

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

MARYLAND AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP
SOMERSET COUNTY, MARYLAND

Scale 1:190,080

1 0 1 2 3 4 Miles

SOIL ASSOCIATIONS

1 Sassafras-Woodstown-Fallsington association: Well-drained to poorly drained, nearly level and gently sloping sandy loams

2 Matapeake-Mattapex association: Well drained and moderately well drained, gently sloping to strongly sloping silt loams

3 Fallsington-Pocomoke-Woodstown association: Very poorly drained to moderately well drained, nearly level and gently sloping sandy loams

4 Othello-Portsmouth association: Poorly drained and very poorly drained, nearly level silt loams

5 Tidal marsh association: Salt water marshland bordering estuaries and on islands

6 Swamp-Muck and peat association: Wet lands of fresh water areas

October 1965

WORCESTER
Inset, sheet 1
Inset, sheet 2
Inset, sheet 48
Insert, sh 51
38°15′
75°35′
75°45′
37°55′
75°55′
Pollitts
Branch
Oakville
Passerdyke
Creek
Eden
Somerset
Loretto
CREEK
WICOMICO
Widgeon
Mount Vernon
COUNTY
Monie
Creek
MONIE BAY
WICOMICO
RIVER
Long Pt
PRINCESS ANNE
Manokin
Taylor
Jones
Kings
Kings Creek
Peggy Boston Swamp
Emanuel Church
Dividing
Creek
Cokesbury
Costen
Costen
Br
RIVER
POCOMOKE
MARYLAND
Rehobeth
Rehoboth
Greenhill
PENNSYLVANIA
PENNSYLVANIA
Westover
Kingston
Hudson Corner
Marumsco
Shelltown
Marumsco
SOUND
VIRGINIA
Back
Manokin
Upper Fairmount
Goose Point
Monie
St Stephen
RIVER
Marion
Tulls Corner
East
Creek
Gap Pt
Lawsonia
Bedsworth
Crisfield
Daugherty
POCOMOKE
COUNTY
ACCOMACK
Broad
Cr
CEDAR ISLAND
ANNEMESSEX
LITTLE
JAMES ISLAND
BIG
ANNEMESSEX
Flatcap Pt
HAZARD ISLAND
Rumbley
MANOKIN
Broad
Cr
Dames Quarter Marsh
Dames Quarter
Laws Thorofare
Chance
Deal Island
Wenona
DEAL
Twiggs Pt
WICOMICO
COUNTY
TANGIER
SOUND
Sheepshead Pt
Pungers Pt
SOUTH MARSH ISLAND
HOLLAND STRAITS
DORCHESTER
KEDGES STRAITS
SMITH ISLAND
Thorofare
Ewell
Fog Pt
Big
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CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail, foot
- Railroad
- Ferries
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings
- School
- Church
- Station

Mines and Quarries

Mine dump

Pits, gravel or other

Power lines

Pipe lines

Cemeteries

Dams

Levees

Tanks

Oil wells

BOUNDARIES

- National or state
- County
- Reservation

DRAINAGE

Streams
- Perennial
- Intermittent, unclass.

Canals and ditches — CANAL, DITCH

Lakes and ponds
- Perennial
- Intermittent

Wells — flowing

Springs

Marsh

Wet spot

Alluvial fan

Drainage ends

RELIEF

Escarpments
- Bedrock
- Other

Prominent peaks

Depressions — Large, Small
- Crossable with tillage implements
- Not crossable with tillage implements
- Contains water most of the time

SOIL SURVEY DATA

- Soil boundary and symbol — Dx
- Gravel
- Stones
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gullies

Soil map constructed 1965 by the Cartographic Division, Soil Conservation Service, USDA, from 1958 aerial photographs. Controlled mosaic based on Maryland plane coordinate system. Lambert conformal conic projection, 1927 North American datum.

GUIDE TO MAPPING UNITS

[See table 3, p. 9, for approximate acreage and proportionate extent of soils; table 5, p. 34, for estimated average acre yields; table 12, p. 60, for irrigation groups of soils; and table 13, p. 62, for drainage groups of soils. The subsection "Engineering Uses of the Soils" begins on p. 45]

Map symbol	Mapping unit	Described on page	Capability unit		Woodland suitability group	
			Symbol	Page	Number	Page
Cb	Coastal beaches	10	VIIIs-2	31	20	40
DoA	Downer loamy sand, 0 to 2 percent slopes	11	IIs-4	28	7	39
DoB	Downer loamy sand, 2 to 5 percent slopes	11	IIs-4	28	7	39
DoC	Downer loamy sand, 5 to 10 percent slopes	11	IIIe-33	28	8	39
DoC3	Downer loamy sand, 5 to 10 percent slopes, severely eroded	11	IVe-5	29	13	40
Fa	Fallsington loam	12	IIIw-7	28	1	37
Fb	Fallsington sandy loam	12	IIIw-6	28	1	37
FdA	Fallsington and Dragston fine sandy loams, 0 to 2 percent slopes	12				
	Fallsington soil	--	IIIw-6	28	1	37
	Dragston soil	--	IIw-5	27	1	37
FdB	Fallsington and Dragston fine sandy loams, 2 to 5 percent slopes	12				
	Fallsington soil	--	IIIw-6	28	1	37
	Dragston soil	--	IIe-36	27	1	37
FgA	Fallsington and Dragston loams, 0 to 2 percent slopes	12				
	Fallsington soil	--	IIIw-7	28	1	37
	Dragston soil	--	IIw-1	27	1	37
FgB	Fallsington and Dragston loams, 2 to 5 percent slopes	12				
	Fallsington soil	--	IIIw-7	28	1	37
	Dragston soil	--	IIe-16	26	1	37
GcB	Galestown loamy sand, clayey substratum, 0 to 5 percent slopes	13	IIIs-1	29	5	38
GlB	Galestown-Lakeland sands, 0 to 5 percent slopes	13	VIIs-1	31	5	38
GlC	Galestown-Lakeland sands, 5 to 10 percent slopes	13	VIIs-1	31	5	38
Gp	Gravel and borrow pits	13	VIIIs-4	31	21	40
Jo	Johnston loam	14	IIIw-7	28	2	38
KfA	Keyport fine sandy loam, 0 to 2 percent slopes	14	IIw-9	27	11	39
KmA	Keyport silt loam, 0 to 2 percent slopes	14	IIw-8	27	11	39
KnA	Klej loamy sand, 0 to 2 percent slopes	15	IIIw-10	29	3	38
KnB	Klej loamy sand, 2 to 5 percent slopes	15	IIIw-10	29	3	38
LaB	Lakeland loamy sand, clayey substratum, 0 to 5 percent slopes	15	IIIs-1	29	5	38
LgB	Lakeland-Galestown loamy sands, clayey substratum, 2 to 5 percent slopes	16	IIIs-1	29	5	38
LmC	Lakeland-Galestown loamy sands, 5 to 10 percent slopes	16	VIIs-1	31	5	38
Lo	Leon loamy sand	16	Vw-5	30	10	39
Ma	Made land	16	------	--	21	40
MfA	Matapeake fine sandy loam, 0 to 2 percent slopes	17	I-5	26	7	39
MfB2	Matapeake fine sandy loam, 2 to 5 percent slopes, moderately eroded	17	IIe-5	26	7	39
MfC	Matapeake fine sandy loam, 5 to 10 percent slopes	17	IIIe-5	28	8	39

Map symbol	Mapping unit	Described on page	Capability unit		Woodland suitability group	
			Symbol	Page	Number	Page
MkA	Matapeake silt loam, 0 to 2 percent slopes	17	I-4	26	7	39
MkB2	Matapeake silt loam, 2 to 5 percent slopes, moderately eroded	17	IIe-4	26	7	39
MkC2	Matapeake silt loam, 5 to 10 percent slopes, moderately eroded	17	IIIe-4	28	8	39
MkC3	Matapeake silt loam, 5 to 10 percent slopes, severely eroded	17	IVe-3	29	13	40
MkD	Matapeake silt loam, 10 to 15 percent slopes	17	IVe-3	29	8	39
MpA	Mattapex fine sandy loam, 0 to 2 percent slopes	18	IIw-5	27	11	39
MpB2	Mattapex fine sandy loam, 2 to 5 percent slopes, moderately eroded	18	IIe-36	27	11	39
MsA	Mattapex silt loam, 0 to 2 percent slopes	18	IIw-1	27	11	39
MsB2	Mattapex silt loam, 2 to 5 percent slopes, moderately eroded	18	IIe-16	26	11	39
Mx	Mixed alluvial land	18	VIw-1	30	2	38
My	Muck and peat	18	VIIw-1	31	21	40
OhA	Othello silt loam, 0 to 2 percent slopes	19	IIIw-7	28	10	39
OhB2	Othello silt loam, 2 to 5 percent slopes, moderately eroded	19	IIIw-7	28	10	39
Om	Othello silt loam, low	19	Vw-1	30	19	40
Oo	Othello silt loam, silty substratum	19	IIIw-7	28	10	39
Os	Othello silty clay loam	19	VIw-2	30	10	39
Ot	Othello silty clay loam, silty substratum	19	VIw-2	30	10	39
Pd	Plummer loamy sand	20	IVw-6	30	10	39
Pk	Pocomoke loam	20	IIIw-7	28	1	37
Pm	Pocomoke sandy loam	21	IIIw-6	28	1	37
Po	Portsmouth loam	21	IIIw-7	28	1	37
Pr	Portsmouth silt loam	21	IIIw-7	28	1	37
Sa	St. Johns loamy sand	22	Vw-5	30	10	39
SfA	Sassafras sandy loam, 0 to 2 percent slopes	22	I-5	26	7	39
SfB2	Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded	22	IIe-5	26	7	39
SfC2	Sassafras sandy loam, 5 to 10 percent slopes, moderately eroded	22	IIIe-5	28	8	39
SfC3	Sassafras sandy loam, 5 to 10 percent slopes, severely eroded	22	IVe-5	29	13	40
SfD	Sassafras sandy loam, 10 to 15 percent slopes	22	IVe-5	29	8	39
St	Steep sandy land	22	VIe-2	30	9	39
Sw	Swamp	22	VIIw-1	31	21	40
Tm	Tidal marsh	23	VIIIw-1	31	21	40
WdA	Woodstown loam, 0 to 2 percent slopes	23	IIw-1	27	3	38
WdB2	Woodstown loam, 2 to 5 percent slopes, moderately eroded	23	IIe-16	26	3	38
WoA	Woodstown sandy loam, 0 to 2 percent slopes	23	IIw-5	27	3	38
WoB2	Woodstown sandy loam, 2 to 5 percent slopes, moderately eroded	23	IIe-36	27	3	38

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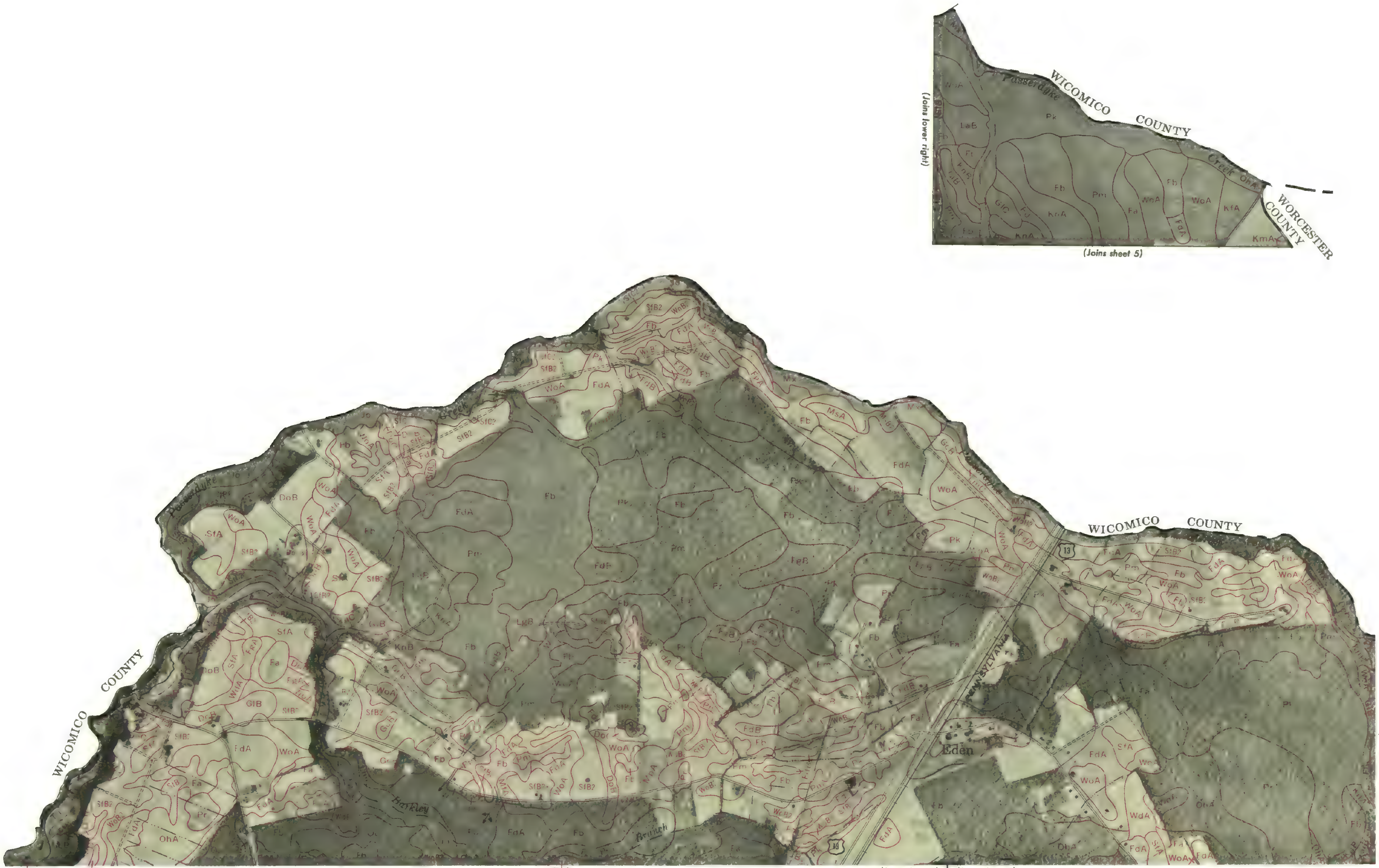

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

(2)


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WICOMICO RIVER
WICOMICO COUNTY
WICOMICO
CREEK
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Ferry
Ferry Point
WICOMICO COUNTY
WICOMICO RIVER
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Webster Cove
Johnston Cr
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Victor Point
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SOMERSET COUNTY, MARYLAND — SHEET NUMBER 3

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

0 ½ 1 Mile — Scale 1:15840 — 0 5000 Feet


4
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This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

6

(Joins sheet 2)

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Scale 1:15840

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(Joins sheet 12) | (Joins sheet 13)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

SOMERSET COUNTY, MARYLAND — SHEET NUMBER 8

(Joins sheet 4)

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(Joins sheet 13) | (Joins sheet 14)

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

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10

(Joins sheet 16)

0 ½ 1 Mile

Scale 1:15840

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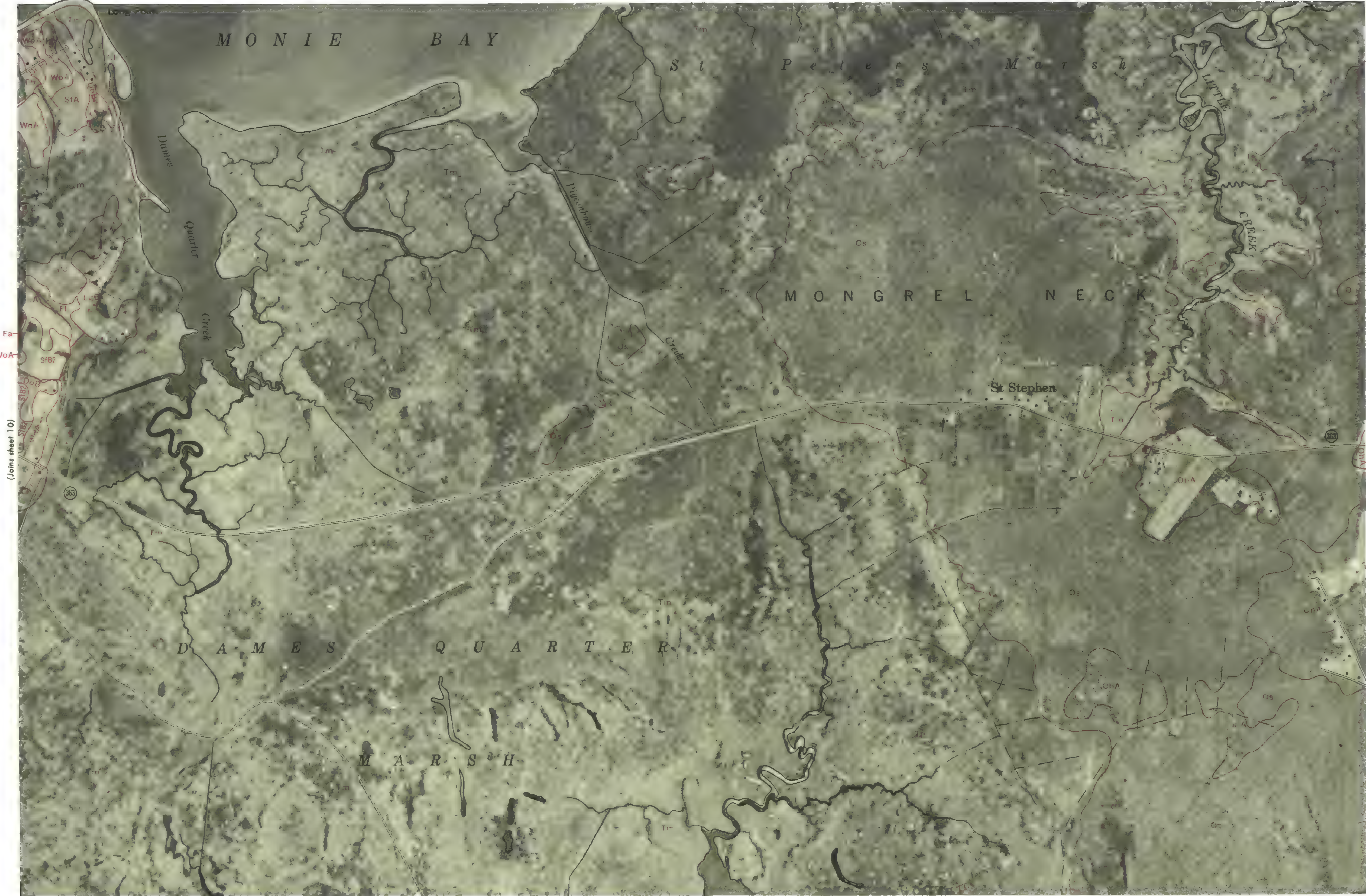

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This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

SOMERSET COUNTY, MARYLAND — SHEET NUMBER 12

(Joins sheet 6) | (Joins sheet 7)

(Joins sheet 18)

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

(Joins sheet 7) (Joins sheet 8)

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0 ½ 1 Mile Scale 1:15840 0 5000 Feet

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SOMERSET COUNTY, MARYLAND — SHEET NUMBER 14

14

(Joins sheet 8) | (Joins sheet 9)

(Joins sheet 13)

(Joins sheet 15)

(Joins sheet 20)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

SOMERSET COUNTY, MARYLAND — SHEET NUMBER 15

(15)

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

Agriculture, and the Maryland Agricultural Experiment Station.

16

(Joins sheet 10)

(Joins sheet 23)

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

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17

(Joins sheet 16)

(Joins sheet 18)

(Joins sheet 24)

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet


18
(Joins sheet 12)
N
(Joins sheet 17)
(Joins sheet 19)
(Joins sheet 25)
Champ
St Peters
Creek
Champ Point
Locust Point
Revels Point
Raccoon Point
Goose Point
Top Point
Clifton Point
MANOKIN RIVER
REVELS NECK
BACK CREEK
Fishing Point
FISHING ISLAND
Inverness
Wolftrap Creek
Maddox Island
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19

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0 ½ 1 Mile Scale 1:15840 0 5000 Feet

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SOMERSET COUNTY, MARYLAND — SHEET NUMBER 20

SOMERSET COUNTY, MARYLAND — SHEET NUMBER 21

21

(Joins sheet 15)

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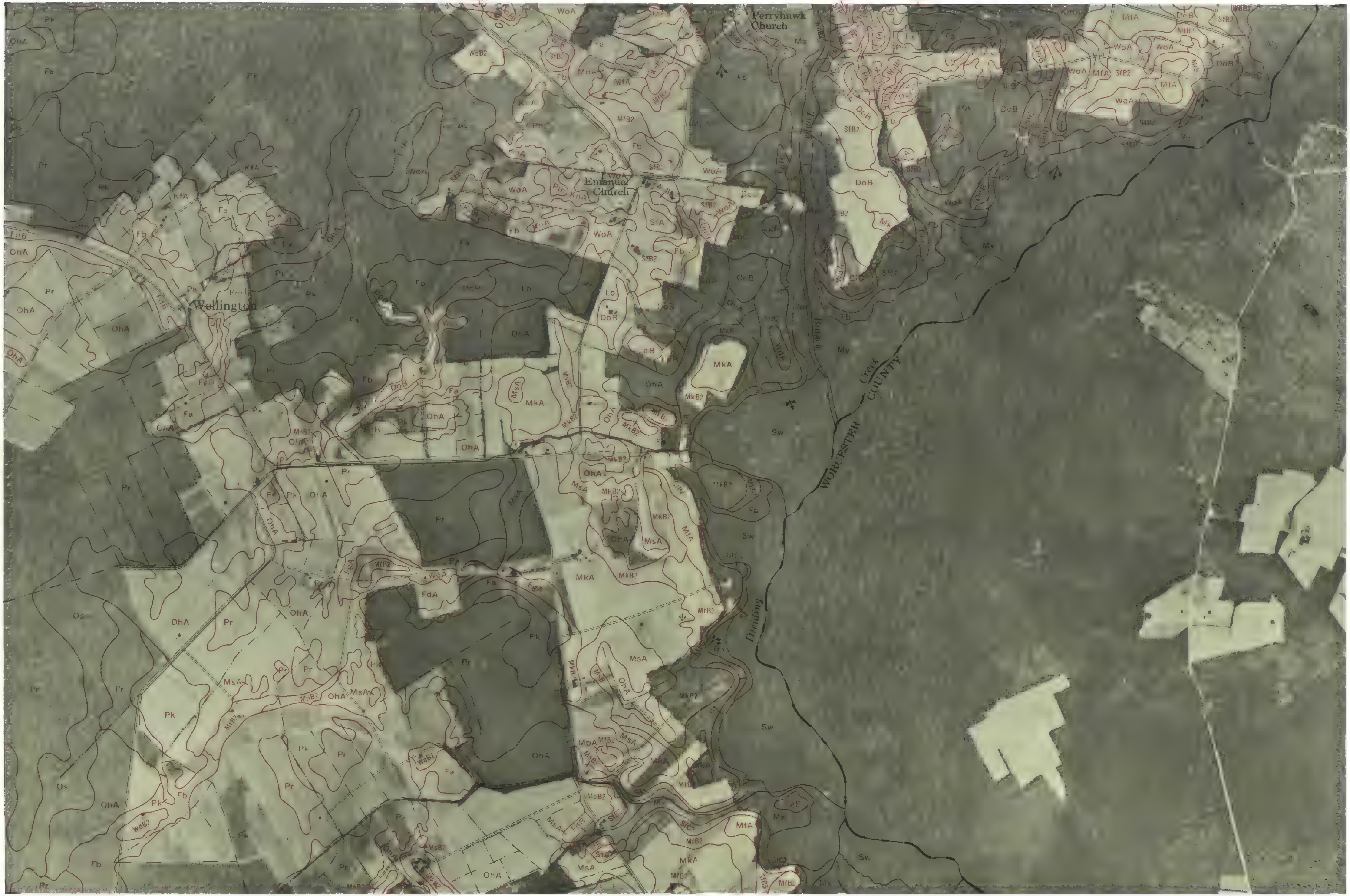
(Joins sheet 20)



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0 5000 Feet

(Joins sheet 29)

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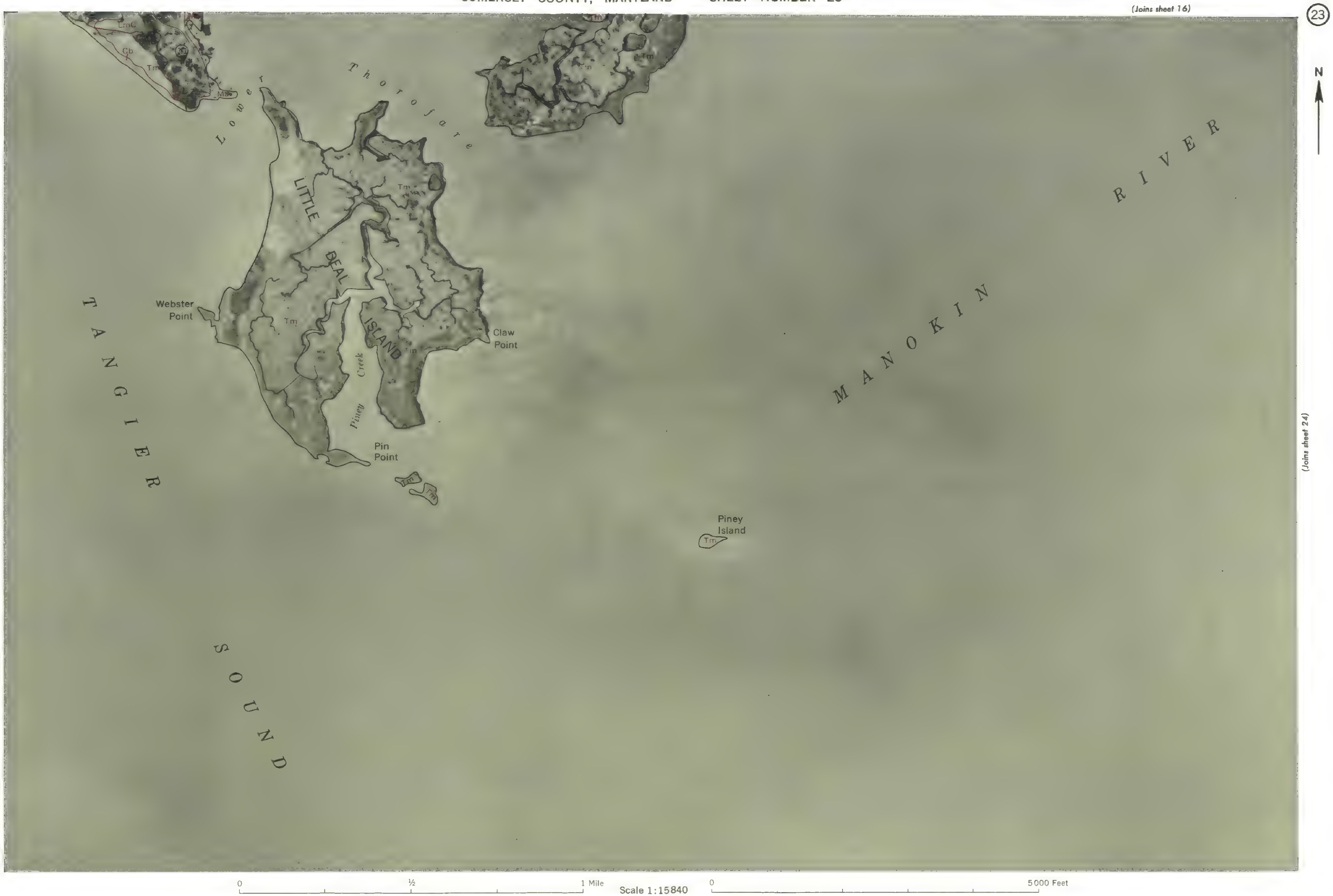

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SOMERSET COUNTY, MARYLAND — SHEET NUMBER 24

(Joins sheet 17)

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(Joins sheet 30)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

25

(Joins sheet 18)

(Joins sheet 24)

(Joins sheet 26)

(Joins sheet 31)

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

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SOMERSET COUNTY, MARYLAND — SHEET NUMBER 26

26

(Joins sheet 19)

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0 ½ 1 Mile Scale 1:15840 0 5000 Feet

SOMERSET COUNTY, MARYLAND — SHEET NUMBER 27

27

(Joins sheet 20)

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

(Joins sheet 26)

(Joins sheet 28)

(Joins sheet 33)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet


28
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(Joins sheet 21)
(Joins sheet 27)
(Joins inset, sheet 34)
(Joins sheet 34)
Cokesbury
Costen
Quinton Church
Tindlys Chapel
DIVIDING CREEK
WORCESTER COUNTY
PENNSYLVANIA
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1 Mile
Scale 1:15840
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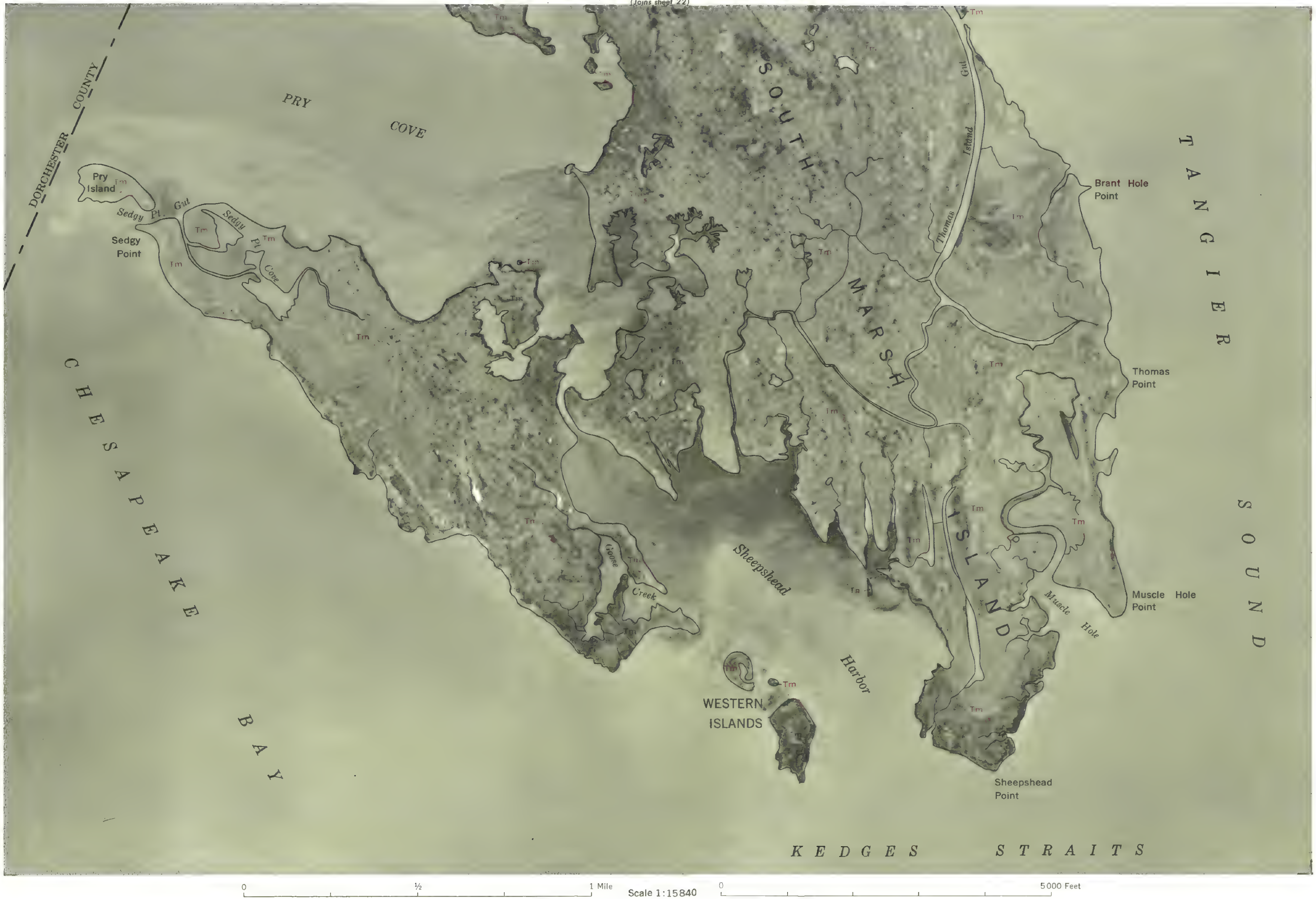

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.


30
(Joins sheet 24)
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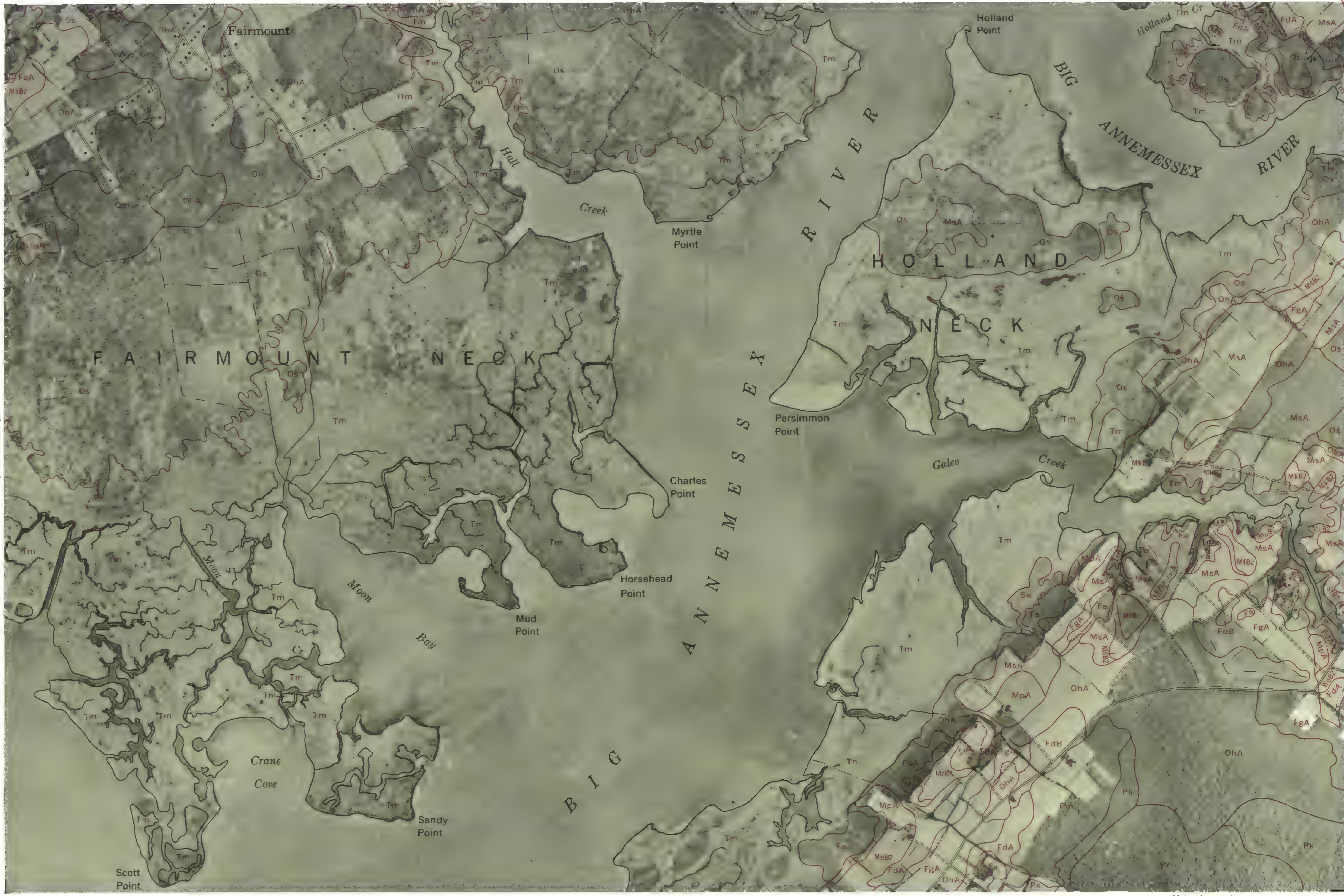
Rumbley
Goose Creek
Prickly Point
T A N G I E R
MINE ISLAND
Mine Creek
Hazard Point
Hazard Cove
H A Z A R D
I S L A N D
Flatland Cove
Shirtpond Cove
Marsh
Muddy Creek
Fords Cove
S O U N D
PAT ISLAND
Mine Cove
B I G A N N E M E S S E X R I V E R
(Joins sheet 31)
(Joins sheet 36)
0
½
1 Mile
Scale 1:15840
0
5000 Feet

(Joins sheet 25)



(Joins sheet 30)

(Joins sheet 32)

(Joins sheet 37)

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

32

(Joins sheet 26)

(Joins sheet 38)

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

SOMERSET COUNTY, MARYLAND — SHEET NUMBER 33

(Joins sheet 27)

33

(Joins sheet 32)

(Joins sheet 34)

(Joins sheet 39)

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

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36
(Joins sheet 30)
N
TANGIER SOUND
BIG ANNEMESSEX RIVER
Wear Point
Jackson Island
Flatcap Point
Red Hole
Rock Pond
Rock Hole
Lawsons Marsh
Acre Creek
Daugherty Creek
Jones Creek
Tm
Cb
(Joins sheet 37)
(Joins sheet 42)
0
½
1 Mile
Scale 1:15840
0
5000 Feet

(Joins sheet 31)

37

(Joins sheet 36)

(Joins sheet 38)

(Joins sheet 43)

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

38

(Joins sheet 32)

N

(Joins sheet 37)

(Joins sheet 39)

(Joins sheet 44)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

(Joins sheet 33)

(Joins sheet 38)

(Joins sheet 45)

0 ½ 1 Mile

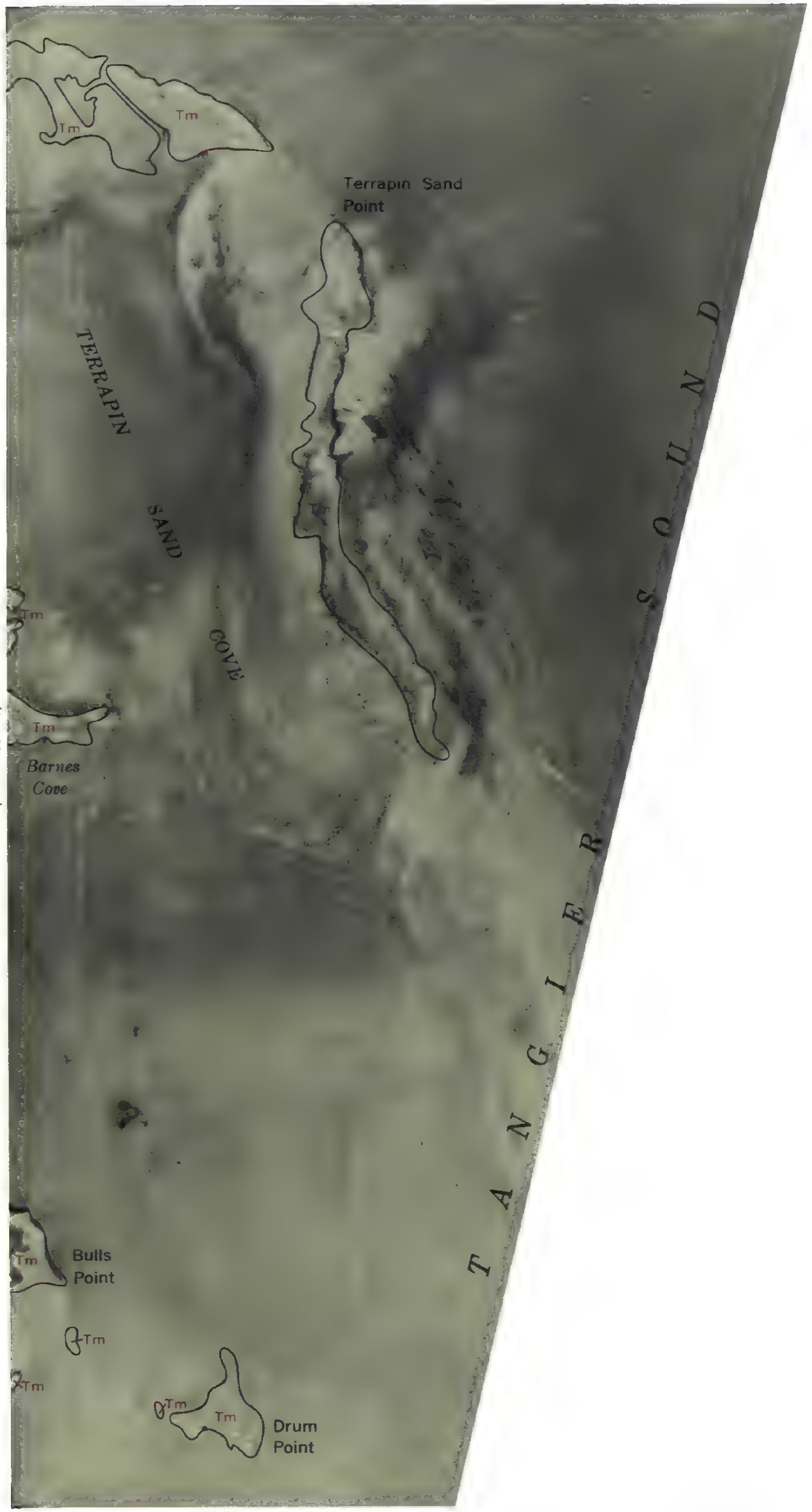
Scale 1:15840

0 5000 Feet


40
(Joins sheet 35)
N
BACK COVE
TERRAPIN SAND COVE
Joes Ridge
Lighting Knot Cove
Sawney Cove
JOES RIDGE CREEK
Channel Point
Swan Island
Boat Harbor
Troy Islands
BIG THOROFARE
I S L A N D
Barnes Landing Creek
Otter Creek
Barnes Cove
(Joins sheet 41)
Anderson Cr
Chaisey Point
Point Comfort
THOROFARE COVE
Ewell
S M
Goose Harbor Cove
Lowring Creek
Tyler Ditch
Easter Point
Long Creek Point
Long Creek
Bare Marsh
Twitch Cove
Wellridge Creek
Jones Cr
(Joins sheet 46)
0 ½ 1 Mile
Scale 1:15840
0 5000 Feet

N

(Joins sheet 40)



0 ½ 1 Mile Scale 1:15840 0 5000 Feet

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42

(Joins sheet 36)

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

(Joins sheet 47) | (Joins sheet 48)

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

(Joins sheet 38)

(Joins sheet 43)

(Joins sheet 45)

(Joins sheet 49) | (Joins sheet 50)

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

45

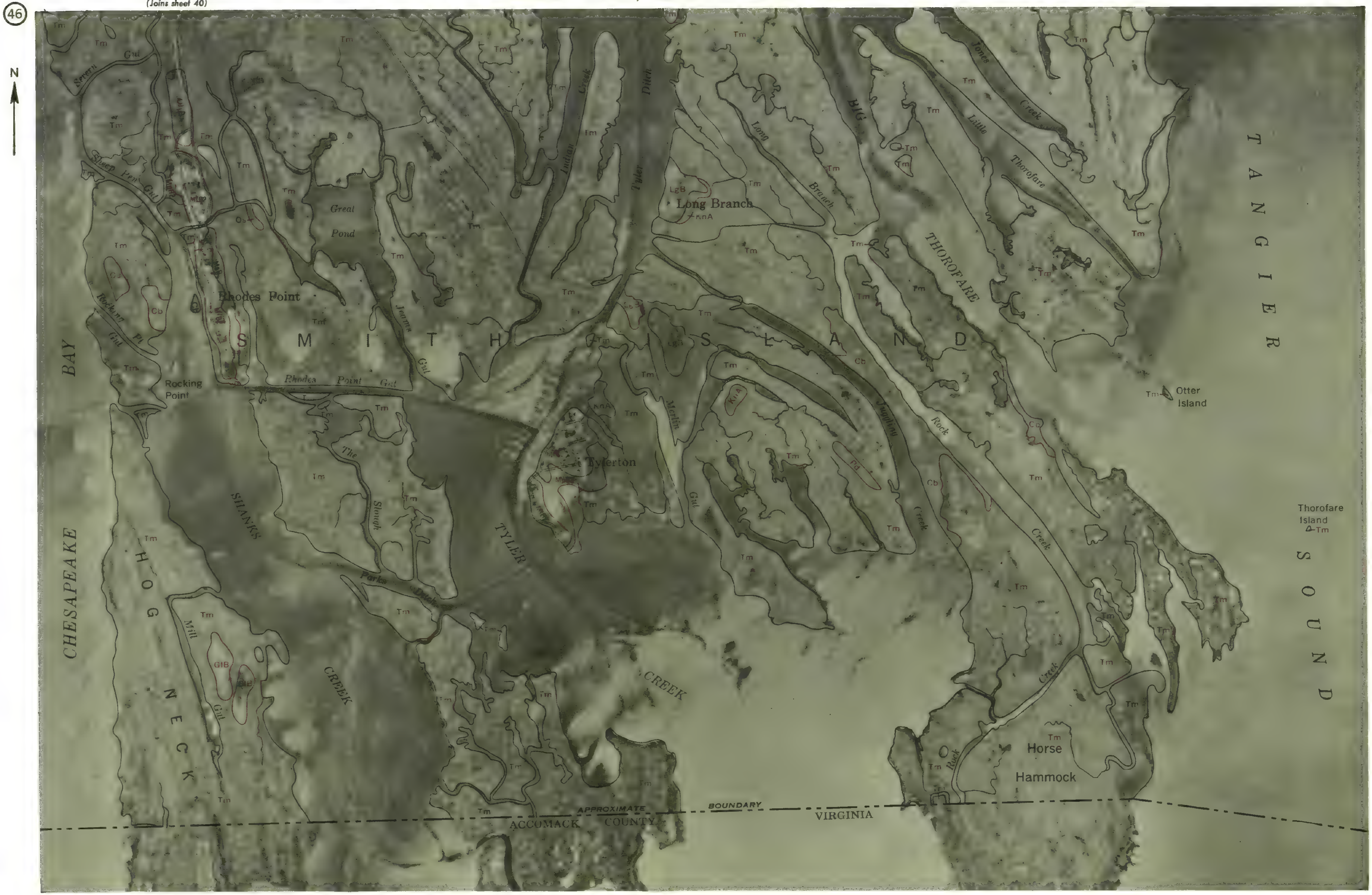
(Joins sheet 39)

(Joins sheet 44)

(Joins sheet 50)

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.



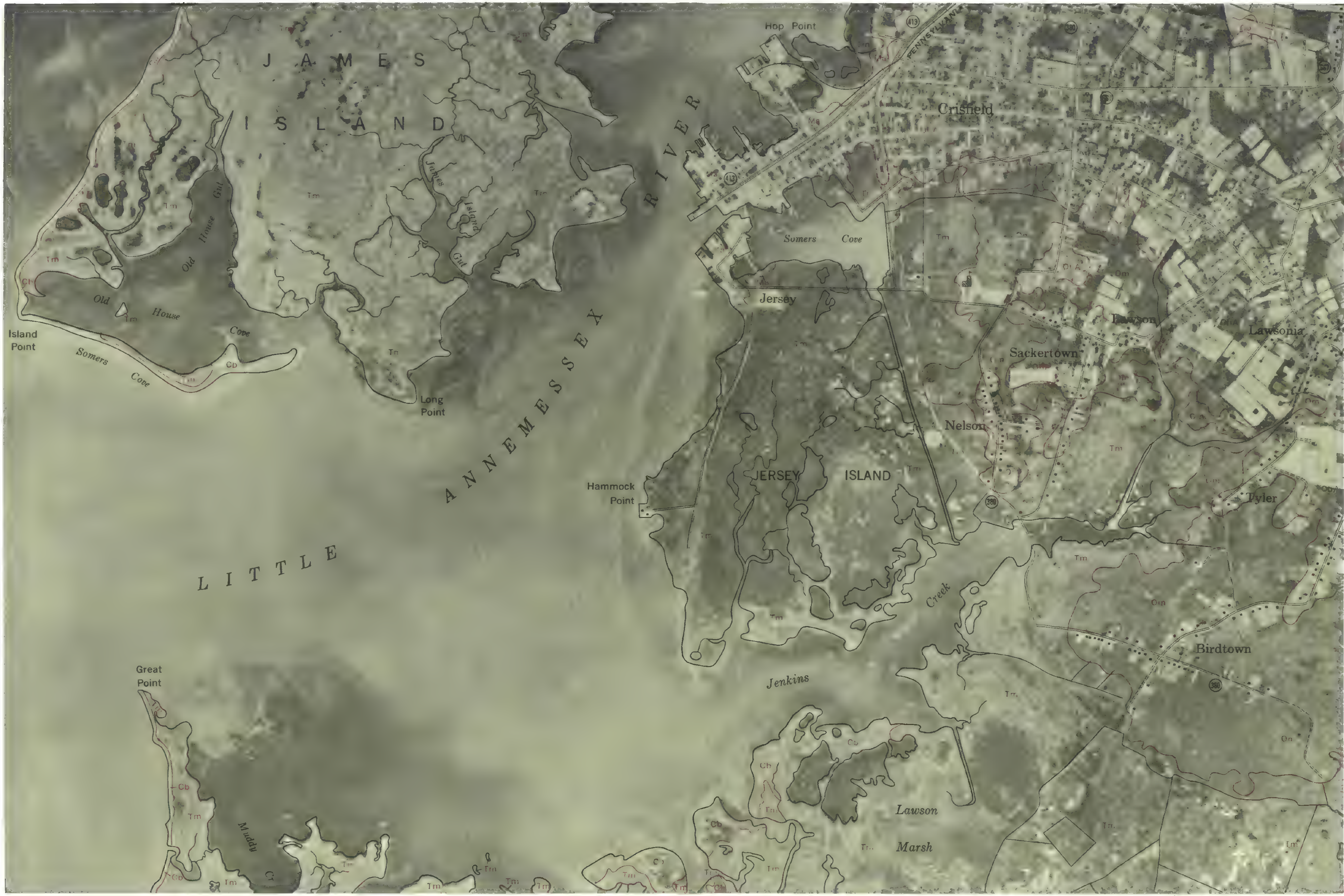
Scale 1:15840

0 ½ 1 Mile

0 5000 Feet

(Joins sheet 42)

47



(Joins sheet 48)

(Joins sheet 51)

0 ½ 1 Mile

Scale 1:15840

0 5000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

SOMERSET COUNTY, MARYLAND — SHEET NUMBER 48

0 ½ 1 Mile Scale 1:15840 0 5000 Feet

(Joins sheet 43) | (Joins sheet 44)

49

(Joins sheet 48)

(Joins sheet 50)

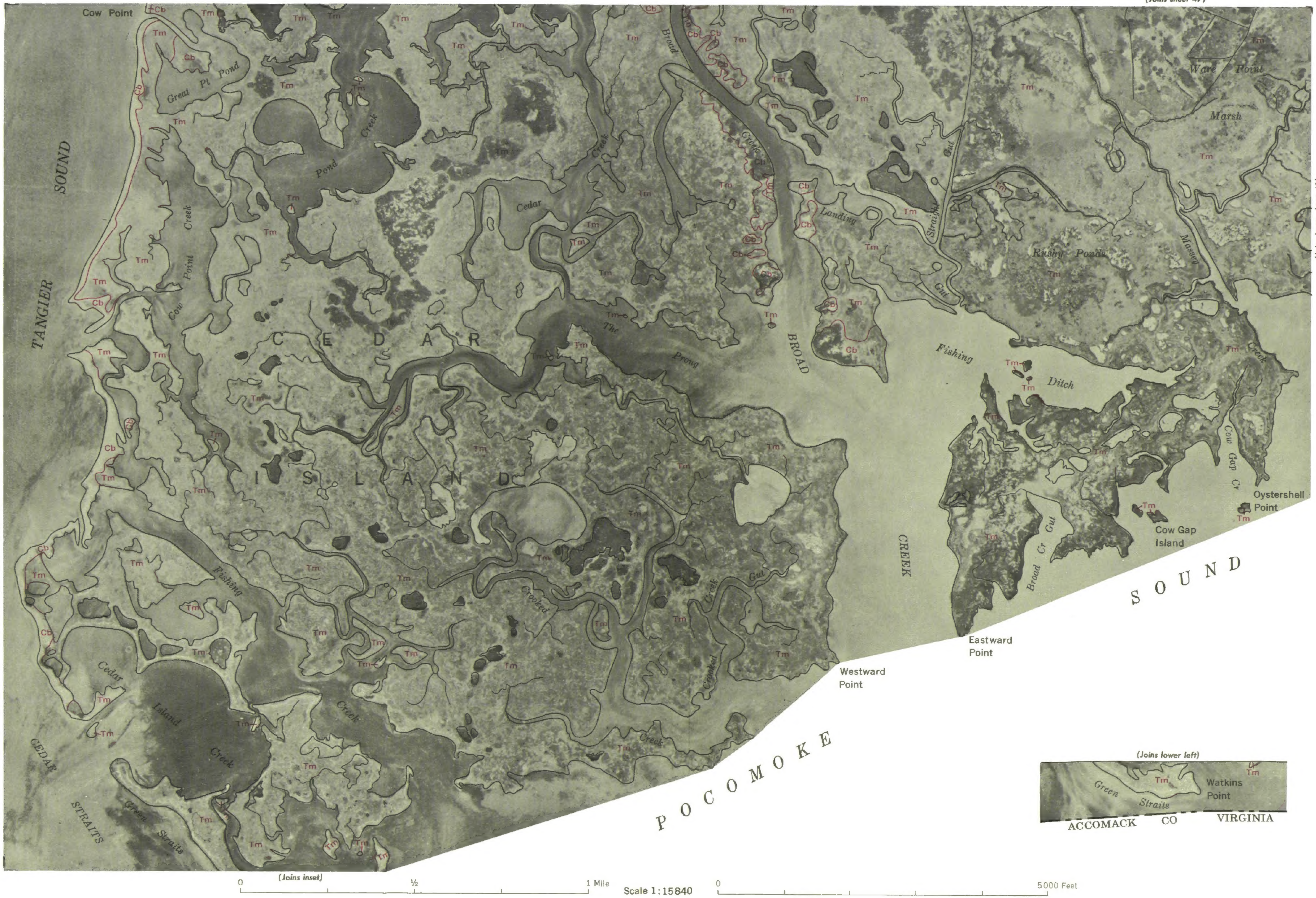
0 ½ 1 Mile Scale 1:15840 0 5000 Feet

This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.

(Joins sheet 44) | (Joins sheet 45)

(Joins sheet 49)

0 ½ 1 Mile Scale 1:15840 0 5000 Feet



This map is one of a set compiled in 1965 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Maryland Agricultural Experiment Station.